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ABSTRACT

This study sought to describe, measure and analyze career patterns from early adolescence into early adulthood, and to measure vocational maturity in junior high school years and explore its predictive validity for subsequent career pattern events. Markov chain analysis was used for the first objective, and multiple discriminant analysis for the second. Data indicated that although sex and vocational maturity were good predictors in early stages, reality variables of family socioeconomic status and intelligence emerged as the dominant predictors of career pattern variables near age 25. Implications for education are that: (1) there is widespread failure to communicate adequately to students the ways in which career success is dependent on general educational attainment; and (2) there is need for a computerized career information system as an integral part of career guidance curriculum. (Author/CJ)

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Warren D. Gribbons
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Paul R. Lohnes
S.U.N.Y.A.B.

1969

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October 1969

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Summary

The Career Development Study collected data from 111 subjects (57 males, 54 females) at six points spaced over eleven years. Two research objectives achieved were (1) to describe, measure, and analyze career patterns from early adolescence into early adulthood, and (2) to measure vocational maturity in junior high school years and explore its predictive validities for subsequent career pattern events. Markov chain analysis proved particularly suitable for the first objective, as did multiple discriminant analysis for the second. A methodological invention that resulted is a prediction system for pattern variables that combines the Markov probability and the trait-statistical models.

The overall impression from the data was that life had gradually eroded the high aspirations of the fantasy residues still present in early adolescence. Although sex and vocational maturity were particularly good predictors of pattern variables in early stages, the reality variables of socioeconomic status of family and intelligence of subject (both measured in 8th grade) increased steadily in value as predictors over time and emerged as the dominant predictors of career pattern variables in their latest stage (near age 25). The conclusion drawn was that the young adults were integrating their fates and their plans through a process of compromise. The career patterns for males appeared to be perturbed in many ways by their military obligations. Housewifery emerged as a chosen or accepted career for many women who did not nominate it when they were interviewed in the 8th grade. Particularly problematic in the light of youthful plans is the finding that most of the college-achieving men have finally eschewed science or technology careers.

Two implications for education that are argued are (1) there is widespread failure to communicate early enough and convincingly enough to students the ways in which career successes of many sorts are dependent on general educational attainment in our society. This hurts especially the youths who are not receiving this message at home; (2) there is urgent need in our schools for a Computerized Career Information System as an integral part of a Career Guidance Curriculum.

ACKNOWLEDGEMENTS

A program of research such as is reported here is always the outcome, directly and indirectly, of the contributions of many people. We owe acknowledgements for help received to more persons and agencies than we can reasonably mention, but we do wish to list some primary sources of assistance and encouragement.

The theoretical formulations and research activities of Dr. Donald Super provided the primary inspiration for this study. Dr. Super has provided access to the data-collection instruments of the Career Pattern Study and has helped with many suggestions over the years.

Dr. David Tiedeman created our interest in research on careers when we were his students some years ago and we have enjoyed his counsel from time to time since then.

Jean Gribbons has made innumerable contributions to all phases of the project.

Many of our students have helped us with our thinking about our research problems. Catherine Lee is co-author of the section of the Report that begins on page 44. Fred Hockersmith managed much of the computer work.

The typing of the manuscript is the work of Marion Fogg, who also arranged a number of the Tables.

All of the financial support for this phase of the project has come from the U. S. Office of Education.

One hundred and eleven young men and women who allowed themselves to be interviewed repeatedly have done the most to make this research possible. We deeply regret the loss of two of them, one to accident and one to war.

To all these and others we express our gratitude.

To our wives, Jean Gribbons and Kathleen Lohnes, we dedicate this monograph.

W. D. G. and P. R. L.

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PART I

THEORY ABOUT CAREERS

Chapter 1

Exploration: Review of Findings on Adolescence

1.1 Introduction

Human behavior is the epicenter of knowledge. Men struggle to know their natural environment better in order to know where they are and what they can do. The subjective elements of need, problem, and purpose permeate the most objective sciencing and engineering. As mastery of our environment advances we are increasingly aware of the importance of studying ourselves. We want to know what people do and to understand why. We need to know what to expect of people under various circumstances. Human behavior poses greater threat to us than anything else in nature, and at the same time we realize that people are nature's greatest potential.

Ultimately, each of us wants to know what to expect of and for himself. It is my own behavior that is the truest epicenter for me. As I know it, my behavior is my experience with living, it is my life and my all to which everything else that I know must be related. You and I can pretend that knowledge is not personal when we converse as fellow scholars, scientists, or educators, but what does the pretense really buy us? In this study of human careers in progress we are going to try to remember and relate to the personess of our subjects, of our audience, and of ourselves. We will give full vent to our needs to abstract, to number and count, to analyze, and to rationalize, but at the same time we will not deny our needs to imagine, to empathize, and to moralize. We pursue scientific knowledge of career development mostly because we want to know how to help young people in their personal struggles for career development. We are educators who want to see our schools do a better job of guiding youths toward useful and satisfying careers. We doubtless do not have this want for heroic or saintly reasons but we do have it, and we are particularly interested in that audience of readers who also have it.

Men work to live. Women do too, most of them. Work is a primary element of man's fate. It is instrumental not only for the necessities of life it earns, but also for the status of responsible adulthood it confers. The lucky man enjoys his work and looks forward to returning to it when he has been away from it for a time.

His work expresses his life in the same way that his family and his avocations do. Good work is very important to good men. But, good work is not everyman's lot in this world. A person has to choose and seek and secure good work, and he has to have some grace and some luck. If he is ill-endowed, or he ill considers, or he blunders repeatedly, he may flounder for years or for a lifetime in a succession of wretched jobs, or he may stagnate endlessly in one awful job, or he may become unemployable. We have neighbors whom we speak of as "hard-core unemployables."

Good work for today is not necessarily good work for tomorrow for the same man. Many men need progression in their work lives over the years. Others need at least some variety. It is not the job circumstances of the moment that a man evaluates so much as it is the pattern in his work history as he has already lived it and as he anticipates the future. His deeper contentment or frustration stems from his contemplation of the long run of his affairs, what his track has been and where he seems headed and how well he is moving. We consume our tomorrows today in the forward rush of our minds, even as we bask in or cower from the reflections of our yesterdays. As career looms larger than job in our lives, career becomes the focal object of our sciencing of vocational development.

If it is desirable for adults to help youths in anything, it is clearly desirable that our schools offer guidance in career development. Guidance is not deciding for young people, but rather providing information that is essential for their own decision making. In order that we may teach valid and useful understandings of career processes we must have a basic research literature of career development studies. A dozen years ago when Donald Super and his colleagues published Vocational Development: A Framework for Research there was little scientific knowledge about career development, but the buildup was already promised by the fact that the Career Pattern Study (CPS) had been collecting data for five years, the Career Development Study (CDS) was starting, and Project TALENT was being planned. Today these three projects have reported a wealth of empirical knowledge about careers, as have many other recent researches. Equally important are the contributions toward theory of career development the investigators in CPS, CDS, TALENT, and other projects have produced. We have a basic research literature now and it is time we addressed ourselves more widely to the implementation of career guidance practices based on this research knowledge. Again, there are leaders already well into the problem.

Our purpose here is to add to the basic research literature a report on the second and final stage of CDS. We have previously reported on the first half of this eleven year study in Emerging Careers (Gribbons and Lohnes, 1968). We are not going to undertake a thorough review and synthesis of the literature at this time because one of us has recently participated in such an effort (Cooley and Lohnes, 1968), and others have done so also (Crites, 1968; Osipow, 1968; Holland and Whitney, 1969). We will review the adolescence of the CDS subjects using freely the ideas we have assimilated from the literature. Then we will review the latest report from CPS (Super, Kowalski, and Gotkin, 1967) since it concerns the same period of development as this report and since CPS has always been the model for CDS. We will report our analyses of data collected four years and six years beyond high school from 110 CDS subjects and what we see as the theoretical implications of the analytical outcomes. Then as the second part of this text we will relate the experiences of CDS youths with the process of career development to the challenge to educators inherent in career psychology.

1.2 Tentative Substage of Exploration

At the beginning of the Career Development Study early in 1958, the 57 boys and 54 girls had an average age of 13.4 years and were eighth graders in five eastern Massachusetts communities. The youngest was 12 years old and the oldest was 15. Their average Otis IQ was 107, with a range from 88 to 131. Their families were well scattered in socioeconomic status and fathers' occupations. One thing the subjects had in common was that all had received an eighth grade group guidance treatment based on You: Today and Tomorrow (Katz, 1958). The subjects were interviewed intensively at that time, and at two-year intervals through early 1969, for a total of six interviews over eleven years.

At the beginning the subjects perhaps belonged in the Capacity Substage of the Growth Stage in the Career Development Stages outlined in Table 1.1. Or, it might be argued, their recent experience of the group guidance program had accelerated many of them into the Tentative Substage of the Exploration Stage. In either case, the subjects have been in the Exploration Stage for most of the period of CDS, and were in the Tentative Substage for most of the first part of CDS as reported in Emerging Careers. We do believe in the progression of developmental stages and tasks described in Table 1.1, but we also believe the ages assigned to be modal rather than governing.

During adolescence the requirements are for understandings of (1) personal abilities and motives, (2) the general structure of career opportunities, (3) an assessment of personal multipotentialities, and (4) tentative decisions for a career future. These may be stated as needs for information and planning. The degrees of fulfillment of these tasks determines the extent of vocational maturity at this stage of life. However, it is crucial for optimal maturation that the decisions be taken to maximize flexibility for the future. It is flexibility or adaptability to criteria for entrance to several or many career tree branches that is termed multipotentiality. At the Tentative Stage the most mature behavior is to know and value one's multipotentiality and to plan to enhance it.

Table 1.1: Career Development Stages*

I. Growth Stage (birth - 14)

   1. Fantasy Substage (4 - 10). Needs and key figure identifications are dominant.

   2. Interest Substage (11 - 12). Likes are the major determinant of aspirations and activities.

   3. Capacity Substage (13 - 14). Abilities are given more weight, and job requirements (including training) are considered.

II. Exploration Stage (age 15 - 24)

   1. Tentative Substage (15 - 17). Needs, interests, capacities, values, and opportunities begin to be synthesized.

   2. Transition (18 - 21). Reality considerations are given more weight.

   3. Trial - crystallization (22 - 24).

III. Establishment Stage (25 - 44)

   1. Trial - specification (25 - 30).

   2. Stabilization (31 - 44). For most persons, these are the creative years.

IV. Maintenance Stage (age 45 - 64)

V. Decline Stage (age 65 on)

   1. Deceleration Substage (65 - 70).

   2. Retirement Substage (71 on).

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*From Super *et al.* (1957), pp. 40-41, with editing and slight adaptation.

1.3 Vocational Maturity Measurement

CPS and CDS have attempted to measure attributes of vocational maturity and to relate the measurements to later educational and vocational adjustments. CDS scaled eight traits in a syndrome termed Readiness for Vocational Planning (RVP) from the eighth grade interview protocols and again from the tenth grade protocols. The resulting 8th and 10th RVP score profiles were then correlated with each other and with all other variables collected in the first four data collections, through two years beyond high school. The resulting network of relationships comprised the empirical base for Emerging Careers. Table 1.2 describes the eight RVP traits.

The RVP profiles were found to be only moderately stable from 8th to 10th grade (over a 2½ year span). The stability displayed by the profiles was taken as evidence of persistence of the syndrome, while the kinds of changes that developed were interpreted as descriptive of the emergence of vocational maturity. There was an increase in mean performance and a decrease in variability of performance on every trait over the 2½ year period. The correlations among the traits also decreased over the 2½ year period. The largest mean increases were for Factors in Curriculum Choice, Values, and Factors in Occupational Choice, in that order. The Interests scale showed the least mean increase. Factor analyses seemed to confirm the multidimensionality of the vocational maturity indicators.

The RVP profiles were found to be related to curriculum plans and placements at several times, level of occupational preference, higher education plans and placements, occupational level and group placements two years out of high school, and judged success or failure of adjustment two years beyond high school. In these predictive validity studies the 8th RVP substantially outperformed the 10th RVP, a matter of surprise and concern to the authors. We decided that we simply had done a poor job of analyzing and collecting information about the contents of vocational maturity at the 10th grade level. We had carried over the same questions and the same scoring scheme from the 8th to the 10th grade interviews, and these seemed to have been very appropriate for the 8th grade but by the 10th grade too many of the subjects had lost interest in these issues. Critics of CDS have pointed to the fact that the 8th RVP scores were somewhat contaminated with intelligence (multiple $R^2 = .32$) while the 10th RVP were not, and have wondered whether the greater predictive validities claimed for the 8th RVP are not really due to this intelligence contamination, since intelligence is a well-known predictor of most of our criteria. Unfortunately, the asserted multidimensionality of vocational maturity led to such conspicuous consumption of degrees of freedom for a study with such small N (total sample size) that joint predictions from IQ and RVP could not be explored. In this report we will retreat to a unidimensional scaling of vocational maturity from the 8th grade protocols in order to recover sufficient degrees of freedom to permit joint predictions from sex, socioeconomic status of family, intelligence, and vocational maturity, and will be able to show that the 8th grade vocational maturity measure does have useful complementary predictive validities.

Table 1.2 Eight Readiness for Vocational Planning (RVP) Scales

VARIABLE I. *Factors In Curriculum Choice*:

Awareness of relevant factors, including one's abilities, interests, and values and their relation to curriculum choice; curricula available; courses within curricula; the relation of curriculum choice to occupational choice.

VARIABLE II. *Factors in Occupational Choice*:

Awareness of relevant factors, including abilities, interests, values; educational requirements for choice; relation of specific high school courses to choice; accuracy of description of occupation.

VARIABLE III. *Verbalized Strengths and Weaknesses*:

Ability to verbalize appropriately the relation of personal strengths and weaknesses to educational and vocational choices.

VARIABLE IV. *Accuracy of Self Appraisal*:

Comparisons of subject's estimates of his general scholastic ability, verbal ability, and quantitative ability with his actual attainments on scholastic aptitude tests, English grades, and mathematics grades.

VARIABLE V. *Evidence for Self Rating*:

Quality of evidence cited by subject in defense of his appraisal of his own abilities.

VARIABLE VI. *Interests*:

Awareness of interests and their relation to occupational choices.

VARIABLE VII. *Values*:

Awareness of values and their relation to occupational choices.

VARIABLE VIII. *Independence of Choice*:

Extent of subject's willingness to take personal responsibility for his choices.

1.4 Career Patterns

Consistent with the belief that the life history of vocational adjustments is more important than any single adjustment, and indeed that the meaning of the single event is created by its relation to the history, recent psychology has shifted its focus from vocational placement to career pattern. Career is conceived as the process of educational and vocational development, and pattern is the profile of scores on a career variable observed repeatedly over a long time span. Since development is usually continuous whereas scientific observation of developmental variables is usually occasional, it might be said that career pattern is the sequence of occupancies of a process variable as its continuous path is monitored intermittently. Theoretically the developmental variable always has a value and is a continuous time series, but practically the variable is measured discretely as a series of periodic values. Four career variables that were subjected to pattern analysis in *Emerging Careers* were (1) transitional coping behaviors, (2) educational aspiration, (3) level of occupational aspiration, and (4) group of occupational aspiration. The method of analysis was to fit Markov chains in an attempt to describe the inherent lawfulness of the developmental variables.

Markov chains are the simplest kind of probability law that can be asserted for career patterns, if we assume as we must that good career variables are not random walks. The primary parameters of chains are probabilities, each of which is the probability of a step from state j of the variable at time t to state k at time $t + 1$. If there are n states or levels of the developmental variable these primary parameters are arrayed in a table with n^2 cells, in which the n rows represent the states at time t (or, the *leaving* states) and the n columns represent the states at time $t + 1$ (or, the *arriving* states). Thus, the probability in row j and column k is the probability of arriving at state k if one is leaving state j. The probabilities on the diagonal of the table from the upper left corner to the lower right corner are probabilities for staying where one was over the time period. The basic assumption of the Markov chain model is that one such table of transition probabilities applies to all transitions, regardless of the value of t. The table is therefore called the matrix of stationary transition probabilities, meaning that transition probabilities are stationary over time.

The assumption of stationarity is of course extremely unrealistic for longitudinal human development variables. However, mathematicians have derived remarkable properties of stationary Markov chains, so we are interested in the powerful analytical products that become available if we achieve even loose fits of our data to chains. Also, since chains are far more reasonable simple hypotheses for developmental processes than are random walks, we are interested in the best fitting chain as a null hypothesis against which to compare more elaborate models for data. The ways in which data misbehave under the best chain hypothesis may be quite instructive to us in our theory building.

Markov chain data analysis begins with computation of the observed transition frequencies for each type of transition and for each time interval. Table 1.3 illustrates the results of this data reduction for a CDS variable called Transitional Coping Behaviors. This variable was produced from clinical ratings of pairs of interview protocols, where each rated pair was a "last" and "current" protocol for the same subject. For each CDS subject, his 1958 8th-grade protocol and his 1961 10th-grade protocol were judged together for the type of transitional coping behavior evidence. Then his 1961 10th-grade protocol and his 1963 12th-grade protocol were paired and yielded a rating. The resulting two scores determined which cell of Transition Matrix 1 (1958/61 - 1961/63) the subject was tallied in. For example, if his 1958 and 1961 protocol pairing was rated as Group 1 and his 1961 and 1963 protocol pairing was rated as Group 2 he was tallied as one of the 26 subjects in row 1 and column 2 of Matrix 1. These 26 people are 37% or .37 proportion of all the subjects who were assigned to Group 1 on the 1958/61 rating. The other 63% remained in Group 1 on the 1961/63 rating. Next, for each subject the 1963 and 1965 (two years beyond high school) protocol pair was rated, making Transition Matrix 2 (1961/63 - 1963/65) possible. Matrices 1 and 2 are the data matrices to which a Markov chain was then fitted.

Table 1.3 illustrates some noteworthy aspects of Markov chain fitting. First, it is desirable to keep the number of states or levels of the process variable small. We had clinical ratings of protocol pairs into Super's five coping behaviors, but we did not want to have to fit 25 parameters in a model for data based on 110 subjects, so we clustered the coping behaviors into a "good" and "bad" dichotomy. (Alternately, it is even more desirable to have the number of subjects large. If we had had 1100 subjects we would gladly have employed Markov variables with as many as five categories, although we consider that seven states or levels is about as many as a chain variable should ever have because of the problems of perceiving and interpreting the details of matrices with more than 50 entries.) For this example, the dichotomous variable is perhaps more reliable and more valid than the five categories, given the youthfulness of these subjects versus the conceptual exegesis of Super's theory of coping behaviors (Super, 1963). Second, the absolute minimum number of time points (or stages) for which observations must be available if a chain is to be fitted is three, so that two observed transition matrices may be computed. We have three sequential ratings involved in this example. Third, the row sum of proportions or probabilities in any transition matrix must be one, since all subjects leaving state $\underline{j}$ must arrive in one of the $\underline{n}$ column states. Fourth, the distribution of subjects at the first observation is particularly interesting and is abstracted as a vector of Initial Probabilities. For this example, almost two-thirds of the subjects started with a "bad" rating for their coping during the first two years of the study. Fifth, transition matrices may be diagonal-dominated, as these are, meaning that each row has its largest probability or proportion in the

Table 1.3: Markov Chain Analysis of Transitional Coping Behaviors

Total Sample, N = 10

Markov	Coping Behaviors
Group 1	floundering; stagnation
Group 2	trial, instrumentation; establishment

Initial Probabilities

Group 1: .64 Group 2: .36

Transition Matrix 1 (1958/61 - 1961/63)
(frequencies in brackets)

	Group 1	1961/63	Group 2
Group 1	.63 (44)		.37 (26)
1958/61			
Group 2	.30 (12)		.70 (28)

Transition Matrix 2 (1961/63 - 1963/65)

	Group 1	1963/65	Group 2
Group 1	.66 (37)		.34 (19)
1961/63			
Group 2	.39 (21)		.61 (33)

diagonal element, so that the best bet for any subject is that he will remain at his present state or level at the next stage.

Fitting a Markov chain is done according to rules for a kind of averaging of the observed transition matrices. All the analytical procedures we use are spelled out in Kemeny and Snell (1960), and the statistical procedures for testing obtained fits may be found in Anderson and Goodman (1957). We have FORTRAN computer programs we can make available (see Appendix F). Table 1.4 presents the Stationary Transition Matrix fitted to our example and some additional analytic results. The stationary probabilities tell us that if one is leaving Group 1 at any time in the history of the process the odds are .64 of arriving again in Group 1 and .36 of arriving in Group 2 at the next observation time, or stage. If one is leaving

Table 1.4: Stationary Transition Matrix

	Group 1	Group 2
Group 1	.643	.357
Group 2	.351	.649

Stationarity hypothesis $\chi_2^2 = .94, \quad .75 > p > .50$

Order zero versus order one $\chi_1^2 = 18.4, \quad p < .001$

Order one versus order two $\chi_2^2 = .66, \quad .75 > p > .50$

Powers of Stationary Matrix for Total Sample Coping Behaviors

Second Power (1958/61 Coping to 1963/65)

1958/61	Group 1	.54	.46
	Group 2	.45	.55

Third Power (1958/61 Coping to 1965/67)

1958/61	Group 1	.51	.49
	Group 2	.48	.52

Limiting Matrix (Equilibrium at Fourth Power)

Group 1	.500	.500
Group 2	.500	.500

Mean First Passage Times (with Standard Deviations in Brackets)

	Group 1	Group 2
Group 1	2.0 (1.9)	2.8 (2.2)
Group 2	2.8 (2.3)	2.0 (1.9)

Group 2 at any time the odds are .35 of arriving in Group 1 and .65 of arriving in Group 2 at the next stage. Since Group 1 is "bad" coping adjustments and Group 2 is "good" coping adjustment, we are led to believe that about two-thirds of the population will retain either a good or a bad rating over any one interval linking two stages. We speak of a population because strictly speaking the stationary probabilities are parameters of a theory for some population based on data analysis for the CDS sample. We wish we had a random sample of a specified population, but of course we do not. We can only say that if we knew a population from which our subjects could be a random sample, then this would be our best estimate of stationary probabilities for that population, assuming stationarity of the process in that population. Theory building from nonrepresentative case studies is a very tenuous business and is strictly exploratory, never confirmatory.

The three chi-square tests are supposed to assure us that (1) the sample data conform to the assumption of a stationary process in the population; (2) the random walk (order zero chain), for which the behavior of subjects on each transition would be strictly independent of their previous histories, may be rejected as a theory for the population described by this sample; (3) the sample data conform to the assumption of one-stage "memory" for the process in the population, meaning that only the last or leaving state for the subject influences his probabilities of arriving in the various possible arriving states, and his history with the process prior to the last or leaving state is irrelevant. This assumption of very short memory for the process is one of the unrealistic aspects of Markov chains as models for human development. We caution ourselves and the reader that for the first and third chi-square tests the desired outcome is failure to reject the null hypothesis, so that the increased sample size that increases the power of the test (the chances of rejecting a false null hypothesis) contradicts our human need for publishable "fits." At least we should know something about the power functions of these tests for sample sizes like ours, and at present we do not. Fortunately there is research on these power functions under way at Syracuse University under the direction of Dr. Silas Halperin.

What do we learn about transitional coping behaviors during the Tentative Substage from this analysis? We learn that there are approximately two chances out of three that a random tenth-grader will receive a negative rating for his 8th-to-10th grade transitional coping behavior, and two chances out of three that whatever rating he receives for this first two-year period will be repeated when the next two-year period is rated. If we have any faith in the clinical ratings, these trends are ominous. What do the data seem to portend for the future? The powers of the stationary matrix project the theory for the process variable into the future, one stage ahead for each integer step in power. When further powering does not change the entries, as occurs for this stationary matrix after the fourth power, the process is said to have reached equilibrium, after which the long-range prediction for all individuals is the same regardlesss of the states in which they originally entered the chain. In our example, the fourth power matrix, describing the theoretical probabilities for the long step from 1958/61 state to 1967/69 state is already the Limiting Matrix which characterizes the process in equilibrium. These particular limiting probabilities are disconcerting in that they project that half of the population will be relegated to bad coping ratings before long and this unfortunate proportion in limbo will be maintained thereafter.

The Mean First Passage Times give the theory's projection of the average number of stages for each of the four types of transitions to occur, along with standard deviations. Thus, subjects leaving Group 1 would arrive back in Group 1 at the average rate of 2.0 stages. Since we know that two-thirds of the subjects will make the passage from Group 1 to Group 1 in one step, this average first passage time of two steps indicates that those who are in the third who do arrive at Group 2 in one step will be quite slow to return to Group 1. This is encouraging for those who "escape" from a bad leaving rating, but unfortunately the same slow rate of return applies to those who "slip" from a good leaving rating. (Note: the symmetry apparent in the matrices of this example is not a general property of Markov chain matrices.)

1.5 Testing Markov Chains

Tables 1.3 and 1.4 report a Markov chain analysis of the data CDS collected on coping behaviors in adolescence. Given our grave doubts about the chi-square tests of goodness of fit, how can we evaluate this chain theory for the coping process? The most rigorous test is to require the theory to predict future events. Table 1.5 reports two views of the predictive validity of the theory based on analyses of the next set of ratings, those from the pairing of the 1965 and the 1967 protocols. In 1967 the subjects were four years beyond high school. Some were already college seniors. The stationary transition matrix ought to describe the conditional distribution of transitions from 1963/65 ratings to the new 1965/67 ratings if the process is stationary. The top part of Table 1.5 compares the theory probabilities with the actual proportions from the data. We see that slightly more escaped from Group 1 on this transition (.43) than predicted (.36), but the arrivals of those leaving Group 2 are exactly as predicted. We could not have a much better fit of data to theory.

The more difficult test for the theory is to predict the long-range outcomes conditional on where the subjects entered the chain in 1958/61 ratings. Technically, the third power of the stationary probabilities matrix gives the predictions for three-step outcomes, but since the fourth power in this case is already the limiting matrix we decided to derive our long-range predictions from it. The bottom part of Table 1.5 compares the actual long-step conditional distributions with those predicted from the equilibrium theory. We see one more person has escaped from Group 1 over the nine-year span than was predicted, whereas two less slipped from Group 2 than predicted. Altogether, this is a fairly tight fitting theory.

Table 1.5 Test of Fit of Stationary Matrix
Against 1967 Observations

Transition Matrix 3 (1963/65 - 1965/67)

	Group 1	1965/67	Group 2	
Group 1	Observed	.57 (33)	Observed	.43 (25)
	Expected	.643 (37.3)	Expected	.357 (20.7)
1963/65	χ^2	= .50	χ^2	= .89
Group 2	Observed	.35 (18)	Observed	.65 (34)
	Expected	.351 (18.3)	Expected	.649 (33.7)
	χ^2	= .01	χ^2	= .00

Goodness of fit hypothesis $\chi_2^2 = 1.40, \quad p \sim .50$

Test of Fit of Fourth Power of Stationary Matrix
Against 1958/61 to 1965/67 Transitions

	Group 1	1965/67	Group 2	
Group 1	Observed	.486 (34)	Observed	.514 (36)
	Expected	.500 (35)	Expected	.500 (35)
1958/61	χ^2	= .03	χ^2	= .03
Group 2	Observed	.450 (18)	Observed	.550 (22)
	Expected	.500 (20)	Expected	.500 (20)
	χ^2	= .20	χ^2	= .20

Goodness of fit hypothesis $\chi_2^2 = .46, \quad .75 < p < .90$

Well, you may say, is all this not telling us more about the behavior of the judges than it is about the coping of the subjects? Perhaps so, although we have some faith in the ratings since we made them. We have been willing to consume this example to illustrate the Markov chain approach to data analysis because we have some more convincing examples up our sleeves for later discussion. What we wanted to show here is how Markov chain analysis can fit a simple probability law to a discrete adjustment variable observed three or more times over a developmental span, and how the new data of the next observation point in the developmental process can be deployed to test the predictive validity of the fitted law. To the extent that the fit is tight, the process variable may be said to follow a simple law that is inherent in its own dynamics, and there would seem to be little need for external predictors of the variable. If the fit is loose or hopeless, the options exist of trying to fit a more complicated type of probability law or searching for external predictors for a statistical law. We are interested in the latter option. We hope to predict statistically from external, antecedent trait predictors the behavior of career pattern variables that are not entirely self-predicting. We have invented a scheme for combining internal chain predictability and external trait-statistical predictability which we will describe and illustrate. We believe all this has practical applications for the design of information systems for career guidance, and we will talk about this, too.

1.6 Discriminant Analysis

From a data analysis viewpoint, the most salient feature of CDS is that its criterion or outcome variables have all been discrete, categorical, nominal or ordinal classification measurements. The criteria have not been the continuously, normally distributed measurement scales that are required by the classical statistical prediction procedures of regression analysis. The reason for this is that career psychology is concerned with the determinants of plans, goals, choices and decisions in the realms of education and vocation, and the natural language for expression and recording of plans, goals, choices and decisions involves the syntax of categorization. People choose and decide in terms of elements from lists, ordered and unordered. Also, people can juggle mentally only small numbers of elements simultaneously, so long lists (e.g., the thousands of occupational titles or the hundreds of names of colleges and universities) naturally get sorted and collected into smaller category schemes (vocational groups or types of colleges). Since our research is intended to help young people plan and decide their career issues it is appropriate that we formulate our criterion variables in rubrics that are natural and suitable for the decision making of such clients.

On the other hand, most of the predictors employed in career psychology are naturally conceived as continuously, normally distributed measurement scales. This is because the major investigations in the field of career development research have started with adolescent subjects and have accepted the existing adolescent personality as the primary basis for predicting future educational and vocational adjustments. It is to individual differences in adolescent personality that CPS, CDS, and TALENT have looked for predictor variables. Personality is considered to be the total repertoire of regular, persistent behavior tendencies of an individual. It is almost the entire universe of action potentials for a person. The behavior trait is the atom of this universe, and the behavior factor is the molecule combined from the atoms provided by traits. The trait is the element of behavior the empiricism of objective psychology observes and records quantitatively; the factor is inferred from the data on traits as a constructed explanation of the observed variances and covariances of traits. The trait is measured directly by applying a scoring formula to a record of behaviors. The factor is measured by applying a scoring formula to the vector of scores on several traits. The factor is essentially the scientist's invention to simplify the network of information created by simultaneous measurement of many traits.

It is conventional and useful to classify behavior traits and factors into the dichotomy of abilities and motives, saying that abilities are what the person can do and motives are what he prefers to do. The distinction, we must remember, belongs to the technology of psychometrics, where maximum performance ability tests have to be discussed separately from typical performance inventories. In the person who is the subject of investigation personality is always a synthetic system in which all the traits are interlocked in one network of correlated behavior tendencies. If we are going to use the analogy of atom and molecule we must be sure that our scientific psychology resembles biochemistry and not physical chemistry.

To clarify the relation of career psychology to trait-and-factor psychology it is helpful to distinguish first phase longitudinal human development research (FPLHDR), which is concerned with the etiology of adolescent and adult individual differences in personality, and looks to genetic, child-rearing, peer group, and school variables as predictors of traits and factors of personality, from second phase longitudinal human development research (SPLHDR), which is concerned with the consequences of individual differences, and uses traits and factors as predictors. Anne Roe and her students represent the sole example of a career research program in the FPLHDR mode. Multiple regression procedures are usually ideal for FPLHDR. CDS and other programs of SPLHDR have had to look elsewhere than regression for data analysis procedures. What statistics do you do when the predictors are a syndrome of normally distributed traits or factors of personality and the criterion is a classification variable?

Under the leadership of Truman Lee Kelley, the Harvard Graduate School of Education became in the 1930's and 1940's a hotbed of inquiry and vision regarding vocational guidance. Kelley, himself an all-round statistician, psychometrician, and individual differences psychologist, what we might term with some awe a mighty traitsman, collected around him a team of similarly inclined younger men who carried on the program after him. This coterie recognized that methodological problems were central to the ambitions they had for vocational development and guidance research. Lohnes (1966) has described Kelley's strong influence on the American practice of factor analysis. Kelley's successors at Harvard concentrated on the problem of statistical procedure for SPLHDR and evolved the multiple group discriminant analysis as a solution. The technical exposition of this strategy can be found in Rulon, Tiedeman, Tatsuoka, and Langmuir (1968) and Cooley and Lohnes (1962). One of the pioneering applications is Tiedeman and Sternberg (1952), in which high school curriculum groups are discriminated in a measurement space based on the Differential Aptitudes Tests. Their paper was titled "Information Appropriate for Curriculum Guidance"! A recent and large-scale application of discriminant strategy is provided by Cooley and Lohnes (1968), who relied upon this methodology for "Predicting Development of Young Adults," an extensive series of Project TALENT followup studies.

Discriminant analysis locates the weighted combinations of the predictor traits or factors which best separate the cells, groups, states, or levels of the classification criterion. When there are three or more cells in the criterion variable there may be two or more linear functions, called discriminant factors, required to fully describe the differences among the cells. These two or several discriminant factors may be conceptualized as uncorrelated factors of the predictor assessment that define a Cartesian subspace within the predictor measurement space in which group differences are best observed. Discriminant analysis is heuristic in that its primary purpose is to discover that subspace in which group differences are maximized. There are inferential statistics of the analysis of variance sort associated with the strategy, but the outcomes of data analysis are mostly descriptive. We learn what the best factors of the personality assessment are for separating the criterion groups and we get a map of the locations of the groups in the space spanned by the discriminant, as well as information about the extent to which the groups overlap each other. We are also able to compute for any subject from his score vector on the personality assessment the relative probability of his membership in each of the groups. This last is an outcome of obvious attractiveness to the guidance counseling game.

An example drawn from Cooley and Lohnes (1968) will not only illustrate the method, but because the TALENT assessment of adolescent personality was practically a complete state-of-the-art one, involving 60 ability traits and 38 motive traits, will also convey the best view we now have of what adolescent personality factors maximally discriminate vocational aspiration groups. As the first step in the research strategy _a la_ Kelley, Lohnes (1966) transformed the 60 ability traits into a derived set of eleven factors, the names of which are reported in Table 1.6. He argued that Verbal Knowledges is a _g_-type intelligence factor; English and Mathematics are scholastic achievement factors; Visual Reasoning, Perceptual Speed and Accuracy, and Memory are differential aptitudes, and the others are special knowledge factors included to insure completeness of the factor solution. He also transformed the 38 motive traits into eleven factors, as named in Table 1.6. Here he argued there are four interest factors, Business, Outdoor and Shop, Cultural, and Science; two activities factors, Scholasticism and Activity Level; two self-concept factors, Conformity Needs and Impulsion, and three lesser factors that again indicate completeness of factoring. The

Table 1.6: Factors for Two TALENT Batteries

Mnemonic	Factor Name	Variance Extracted
	Abilities Domain Factors	
VKN	Verbal Knowledges	18.7 %
GRD	Grade	7.8
ENG	English Language	6.6
SEX	Sex	5.7
VIS	Visual Reasoning	5.3
MAT	Mathematics	4.1
PSA	Perceptual Speed and Accuracy	3.6
SCR	Screening	3.3
H-F	Hunting-Fishing	2.2
MEM	Memory	2.1
COL	Color, Foods	1.9
ETI	Etiquette	1.6
GAM	Games	1.5
	(13 factors extract 64.6 % of variance)	
	Motives Domain Factors	
CON	Conformity Needs	11.1 %
SEX	Sex	9.1
BUS	Business Interests	8.7
OUT	Outdoors, Shop Interests	6.8
SCH	Scholasticism	6.6
CUL	Cultural Interests	5.8
SCI	Science Interests	4.3
GRD	Grade	4.2
ACT	Activity Level	4.0
LEA	Leadership	3.1
IMP	Impulsion	2.8
SOC	Sociability	2.8
INT	Introspection	2.4
	(13 factors extract 71.5 % of variance)	

value of this *a priori* factoring of the enormous predictor battery of 98 traits is that it gives us a reasonably concise set of rubrics in terms of which to conceptualize adolescent personality. The original 98-atom assessment profiles of the 9,122 male TALENT subjects were transformed into the 22-molecule profiles before the discriminant analysis was computed. Thus the 12th grade personalities of these youths are represented in this study by their 22 factor scores, which are termed MAP scores. The score vector for each youth represents a point in the 22-dimension MAP space. For this study that point is the abstraction of his adolescent personality. Science always deals with a less-than-real world.

The criterion variable was coded from the five-year followup questionnaires and represents the career aspirations of the subjects at a point when they were five years beyond high school and five years after their personalities were assessed. Table 1.7 names the twelve categories into which the aspirations were grouped, along with the percentage of males five years beyond high school estimated by Project TALENT to be in each aspiration group. (The rationale for this grouping is explained in the next section of this chapter.) For the moment, note that the criterion depends on both educational and vocational aspirations. It reflects both interest orientation and level of aspiration.

By analysis of variance *F*-ratios the 22 MAP measures were ranked for strength of association between predictor and the classification criterion, and the means for the 12 groups on the nine top-ranking measures appear in Table 1.8. Scholasticism, a motive variable, had the largest *F*-ratio, followed by Mathematics and Verbal Knowledges, two abilities, with the three Interests--Science, Outdoor and Shop, and Cultural--coming next in ranking. Then comes Visual Reasoning, followed by Business Interests and Sociability. Three abilities and five motives figure in the first nine rank positions. The multiple R values may be read as correlation ratios between the MAP measures and the classification. These range from moderate (.54) to weak (.18). No single MAP measure is a strong predictor of the criterion. We see that the research scientists and medical doctors are highest on Verbal Knowledges, Mathematics, Scholasticism, and Science Interests. All the group centroids (profile of means) are convincing. (You should know that the MAP factors were scaled to population mean of 50 and standard deviation of 10.) The ways in which the four interests differentiate groups with similar abilities are particularly noteworthy (e.g., B.A. Business and B.A. Sociocultural groups differentiated by the higher Cultural Interests of the latter).

Although 11 discriminant factors are possible in analysis of 12 groups in 22-dimensional space, in fact only three useful discriminant factors were found, and these are described by their correlations with the 22 predictors in Table 1.9. The canonical correlations may be read as correlation ratios between the discriminant factors and the classification. Only the first canonical R is

Table 1.7: Twelve-category Criterion for 1965 Followup Plans (five years out of high school), N = 14.799

			Mnemonic
1.	Ph.D. or M.D., Biological and Medical Sciences	1 %	MED
2.	D.D.S., M.S., or B.S., Biological and Medical Sciences	2	BIO
3.	Ph.D., Physical Sciences and Mathematics	1	RES
4.	M.S. or B.S., Physical and Sciences and Engineering	8	ENG
5.	Skilled and Technical Occupations with Post-High-School Training	15	TEC
6.	Laborers, No Post-High-School Training	9	LBR
7.	Clerks and Office Workers, No Post-High-School Training	17	CLK
8.	Noncollege, Nontechnical, with Post-High-School Training	19	ACT
9.	B.S. or B.A., Business	10	BUS
10.	Graduate School, Business	1	MGT
11.	B.S. or B.A., Sociocultural	12	WEL
12.	Graduate School, Sociocultural	5	PRF

substantial, but it shows a relation between the discriminant and the classification (.54) that is considerably higher than that of the best single predictor, Scholasticism, with the classification (.69). Cooley and Lohnes named the first function Science-oriented Scholasticism, because of its strong correlations with SCH (.78), MAT (.73), VKN (.62), and SCI (.54). The second function, called Technical versus Sociocultural, separates people who are strong on MAT and VIS abilities and OUT interests from those high on CUL and SOC. The third function separates high BUS and SOC people from high CUL people. One important aspect of this finding is that the best discriminant factors require contributions from both abilities and motives in their definitions; also important is which abilities and which motives are heavily involved in the discrimination. Table 1.10 reports the centroids of the 12 groups in the three discriminant space, and Figure 1.1 plots the locations of the 12

Table 1.8: Group Means on Best MAP Predictors (with Multiple Regression Coefficients for Factors) for 1965 Five-Year Followup Career Plans

Career Plans Group	N	RANK:	3	2	8	9	1	5	6	4	7
		FACTOR:	VKN	MAT	VIS	BUS	SCH	OUT	CUL	SCI	SOC
		Mult R:	.44	.54	.18	.18	.54	.33	.29	.41	.25
1 MED	279		61	80	56	44	62	57	42	73	45
2 BIO	438		57	69	59	45	56	62	38	70	50
3 RES	221		61	84	60	45	63	60	38	72	42
4 ENG	939		56	74	61	47	57	64	35	69	48
5 TEC	1,297		50	59	60	46	49	67	35	61	50
6 LBR	706		46	54	57	47	46	69	34	56	50
7 CLK	530		49	53	55	49	48	64	37	58	52
8 ACT	1,430		53	57	57	49	49	63	38	60	54
9 BUS	1,214		56	65	56	50	54	61	36	65	53
10 MGT	270		60	75	57	52	59	57	36	68	50
11 WEL	1,183		57	64	57	48	54	60	43	64	51
12 PRF	815		61	72	55	47	59	57	44	66	49

Table 1.9: Factor-Discriminant Correlations and Canonical Correlations for Five-Year Followup Career Plans in Twelfth-Grade MAP Space

	Discriminant Functions		
	I	II	III
Canonical Correlation	.69	.37	.23
MAP Factors			
Abilities			
Verbal Knowledges	.62	.20	-.07
Perceptual Speed, Accuracy	.02	.10	-.17
Mathematics	.73	-.49	-.07
Hunting-Fishing	-.10	-.26	-.03
English	.28	.23	.06
Visual Reasoning	-.01	-.43	-.07
Color, Foods	.08	.10	.15
Etiquette	.05	.07	-.10
Memory	.00	.01	.05
Screening	-.33	-.25	.05
Games	.10	-.05	-.29
Motives			
Business Interests	-.04	.31	-.51
Conformity Needs	.21	.12	-.08
Scholasticism	.78	-.19	-.06
Outdoors, Shop Interests	-.41	-.42	.07
Cultural Interests	.25	.47	.61
Activity Level	-.22	-.10	-.10
Impulsion	-.01	.08	-.06
Science Interests	.54	-.36	-.23
Sociability	-.19	.47	-.43
Leadership	.28	.22	.04
Introspection	-.06	-.03	.18

DF I: Science-oriented Scholasticism
DF II: Technical versus Sociocultural
DF III: Business versus Cultural

Table 1.10: Discriminant Function Centroids for 1965 Five-Year Followup Career Plan Groups

Plan Group		DF I	DF II	DF III
1	MED	64	48	54
2	BIO	55	47	50
3	RES	62	41	52
4	ENG	54	44	48
5	TEC	43	46	51
6	LBR	38	48	53
7	CLK	41	52	50
8	ACT	45	53	49
9	BUS	52	52	46
10	MGT	59	51	45
11	WEL	53	54	52
12	PRF	59	54	53

groups in the plane of the best two discriminant factors. It is a very informative mapping of career aspiration groups in a personality plane. A lot of money and effort went into this trait-statistical assay of 9,000 lives. Can the findings be made available to young people living their lives in ways that will help them to think out their possible futures?

Discriminant analysis played the major data reduction role in the first part of CDS, and we now have a new series of such analyses to report involving criteria from the four years beyond high school (1967) and six years beyond high school (1969) interviews. Chapters 2 and 3 contain these studies. We do not have the detailed assessment of adolescent personality that TALENT has, but we are able to complement intelligence with sex, socioeconomic status of family, and vocational maturity measures as additional predictors of career adjustments in early adulthood.

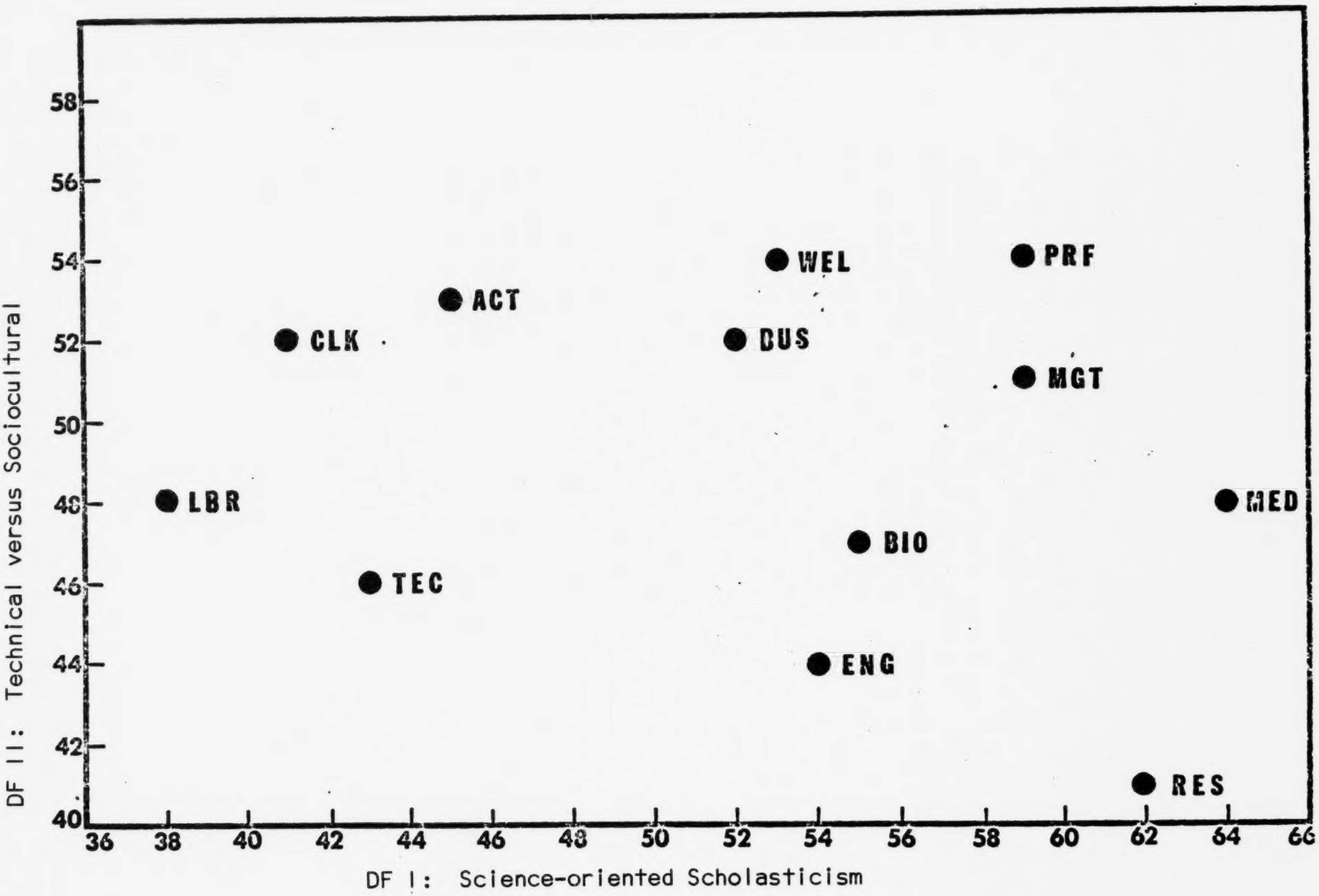

Figure 1.1: Centroids of Five-Year Followup Career Plan Groups in Discriminant Plane

1.7 Summary

CDS concentrated on indicators of vocational maturity as hypothesized by Super in its 8th and 10th grade interviews, conducted with the same 57 boys and 54 girls in 1958 and 1961. The key indicators turned out to be information relevant to high school curriculum choice and planfulness. There was evidence of continuity and progress in vocational maturity traits over the 2½ years, but it was also observed that some youths seemed to be better prepared for decision making in the 8th grade than others were in the 10th grade. The authors believed that many students were ill-prepared for the forced choice of a high school curriculum.

Vocational maturity, especially as measured in the more successful 8th grade RVP scales, was found to be related to subsequent educational and vocational aspirations, plans, and choices during and in the two years immediately after high school. The 8th grade RVP also were related to judged success or failure in coping behaviors two years beyond high school.

Several career pattern variables were reduced to reasonably fitting Markov chains in a methodological probe that seemed promising for the future of the project. Discriminant analysis was shown to be an appropriate data analysis procedure for second phase longitudinal human development research such as CDS, but it was apparent that a link-up of Markov chain and discriminant procedures should be developed.

Overall, life seemed to be grinding away at the idealism or phantasies of the young people during the Tentative Substage of Exploration. Early on there was obvious, extensive overaspiration. Gradually the aspirations for higher education and professional vocations eroded and goals and expectations became more realistic.

Chapter 2

Transition: Four Years Beyond High School

2.1 Framework of the Study

In 1958[1] the senior author initiated the first stage of this longitudinal study with a carefully-selected sample of 111 junior high school students. Personal interviews were conducted with the 57 boys and 54 girls using an interview schedule designed to stimulate the youngster to demonstrate his ability to analyze and synthesize facts about himself and the world of work in making decisions for the future. Basically, the complex and multidimensional interview schedule was concerned with aspects of the quality of planning done by youth. It was hypothesized that the scales based on the interview protocol would provide a basis for predictions of emerging career groupings and thus enrich the knowledge and theory of career development. Because so much rich and potentially valuable material was obtained in these interviews and from the school records, the senior author applied for funds to continue study of the careers of these youngsters until they would be in rather stable stages of their career development. Thus far, under funding from the U. S. Office of Education (Projects No. 5-0088 and No. 6-2151) the subjects have been interviewed every two years from grade eight to four years out of high school, excepting only three subjects not reached in the period covered by this report. The results of the first phase of this project, which includes grade eight to two years out of high school, are reported in detail in Career Development, Cooperative Research Project No. 5-0099, 1966 and Emerging Careers, Gribbons and Lohnes, 1968, Teachers College, Columbia University.

The longitudinal study of careers has had the following specific objectives:

1. Test the theory of occupational choice which proposes a process running through a sequence of developmental stages.

2. Determine whether there are significant sex differences in career sequences.

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[1] This was the first of two interviews which attempted to evaluate the short-term effect of a group guidance unit, You: Today and Tomorrow, written by Martin Katz (1968) for the Guidance Inquiry of Educational Testing Service. This study was supported in part by the Rockefeller Brothers Fund and in part by Educational Testing Service, Princeton, New Jersey. Only the pre-YT&T interviews have been used in the Career Development Study.

3. Describe in detail 110 real careers over eleven years of development, and seek unifying mathematical and psychological models for them.

4. Determine the extent to which career decisions are based upon selecting self-concept and other factors, answering such questions as:

What is the role of intelligence in choosing, entering, and remaining in an occupation?
What is the role of values in making choices?
What is the impact of value shifts as they occur with maturation?
What effects do familial and societal pressures have in shaping occupational aspiration?

5. Accomplish a successful multidimensional scaling of early vocational maturing from an interview protocols, naming the resulting scales, as a set, Readiness for Vocational Planning (RVP).

6. Explore the statistical dependence of numerous criteria of career development on the RVP scales, with the criteria being collected in followup interviews every two years for a total of eleven years.

It was recognized from the outset that the use of a personal interview and a longitudinal design would limit the number of subjects we could include in the study, but it is our judgment that the followup personal interview produced data of a quality and completeness that could not be matched using any other research design. The rapport generated by the interview not only preserved contact with all subjects from grade eight to two years out of high school and a loss of only three subjects in the four years out of high school collection, but it seems to have encouraged a sincerity of responses which questionnaires do not seem to evoke. Therefore, we continued with this design as the best available method for reaching the objectives. In addition to the personal interviews, however, at four years out of high school all subjects completed a number of questionnaires and inventories.

Although it was not possible to achieve a random sample of communities for this investigation, comparisons of characteristics of the five Massachusetts communities in the sample--Beverly, Newton, Revere, Somerville, and Stoneham--with other urban communities in the U. S. indicated that, in most respects examined (e.g., Trends in Population, Distribution of Population by Age, Educational Level of Persons Twenty-Five Years and Over, Civilian Labor Force, Employed Personal Classified into Occupational Groups, and Income in 1949) the sample cities as a whole do not differ greatly from national trends. (U. S. Bureau of Census, 1953)

The 57 boys and 54 girls included in the study were selected from nine classrooms in the five cities by means of a random numbers table. The mean I. Q. of the group as measured by the Otis Test, Beta Form, was 107 with a range from 88 to 131. The ages, in the eighth grade, ranged from 144 months to 190 months with an average age of 160 months. Socioeconomic status, rated by Hamburger's revision of Warner's scale (1957) indicated that all major occupational groups were included among the parents of students in the sample, and there was a tendency for the occupations to fall at the middle of the scale.

It was recognized that the inclusion of both sexes in a sample of this size involved some risks, but careful consideration sugeested it would be worthwhile. Up to that time, little or no attention had been given to the career development of girls. Do they also go through developmental stages? If they do, are they similar to the stages delineated for boys? If they differ, how effective is their counselling when boys and girls are not treated differently?

The main technique for gathering data has been standardized personal interviews with each subject. The interview schedule, which was modified as changes became necessary, was devised in a pilot study before use with this group. (A complete set of interveiws and scoring manuals used from grade eight to high school plus two years can be found in Career Development, Project No. 5-0088, 1966.) Most of the questions were designed to stimulate the pupil to reveal his thinking process in making choices and to demonstrate his ability to analyze and synthesize information about himself and the educational and vocational worlds.

A review of instruments used by other researchers, particularly those of Super's Career Pattern Study and Project Talent, resulted in the selection of a number of questionnaires and scales which were administered to each subject when applicable. In choosing the particular instruments to be used, it was necessary to consider the amount of time we could reasonably expect from our subjects without losing rapport or their interest, as well as the amount of useful information a sample of this size could supply. A short description of the HS+4 instruments follows. (See Appendix A for complete instruments.)

Personal Interviews

Seventy-eight questions designed to obtain in some depth the subjects' attitudes toward work, education, homemaking, satisfaction with work and life in general. Subject is given opportunity to demonstrate his thinking processes in making vocational and educational decisions. For the most part these responses will be used as criterion data and correlated with data obtained from earlier personal interviews.

N = 105
Time required: 1 to 2 hours

Interest Inventory - Project Talent

Designed to measure the relative interests in occupations which range from bookkeeping to U. S. Senator. Subject indicates his degree of interest in each of 122 occupations. These findings will be related to earlier stated interests of subjects and to eighth and tenth grade Readiness for Vocational Planning (RVP) scores.

N = 106
Time required: Approx. 10-15 minutes

Activities Inventory - Project Talent Personality Test

Answers will help to "add to knowledge of how personality differences account for the differences in accomplishment of equally talented normal people."

N = 106
Time required: Approx. 10-15 minutes

Occupational Aspirations Scale and Work Beliefs Inventory, Haller and Miller, Michigan State University

Designed to determine both realistic and idealistic expressions of level of occupations aspirations as well as attitudes and beliefs toward work. Subject's level of occupational aspirations can be compared with that of his fellows and correlated with RVP scores and I. Q. and Socioeconomic status.

N = 106
Time required: Approx. 20 minutes

Job Master Form, Career Pattern Study

Subject details job experience, rates satisfaction in many facets of job, and general feelings of success with present job. Data will be correlated with data collected in earlier interviews.

N = 91
Time required: Approx. 20 minutes

Military Form, Career Pattern Study

Subject details past and present military status, training experiences, and his evaluation of success and satisfaction with military experiences. Responses will be correlated with earlier responses, especially eighth and tenth grade RVP scores.

N = 19
Time required: Approx. 20 minutes

Training and Education Form, Career Pattern Study

Details past and present educational status, success and satisfaction in various aspects of training/education programs. Data will be correlated with data collected in earlier interviews.

N = 60
Time required: Approx. 20 minutes

Our initial HS+4 contacts were telephone calls to the subjects' homes or other places they had suggested in previous meetings to ascertain that our addresses and names, in the cases of married women, were correct. In only one case did a parent refuse to give her son's military address or to forward our letter to him. The next step was to mail to each subject an individually-typed letter requesting a meeting, an appointment form to be filled out, and a self-addressed, stamped envelope. Of the 110 living subjects, 70 responded to the first request, 31 required a followup registered letter and/or a telephone call, and several letters or telephone calls were required for five subjects. These efforts resulted in the completion of 92 personal interviews and 14 mailed questionnaires.

In order to hold the interviewer variable at a minimum, two interviewers conducted the personal interviews; 64 were interviewed at Regis College, 23 were interviewed at the subjects' homes in the Metropolitan Boston area, and 5 subjects were interviewed within a 250 mile radius of the Boston area.

2.2 Status of Subjects at High School Plus Four Years

Table 2.1 displays for each subject his actual high school plus four years (HS+4) educational and occupational status, and his occupational and educational aspirations. (Similar listings for Grade 8 to HS+2 are contained in Career Development, Gribbons and Lohnes, 1966. For most of the subjects, present occupational status can be classified within a few general categories; 25 students, 16 military personnel, 27 clerk-secretaries, and 14 housewives. Thus 82 of 109[1] subjects are found within four occupational categories. As would be expected, particularly with so many students and military personnel, a much wider range of occupations is noted when one considers aspirations. Twenty men aspire to occupations in the business-managerial area, 11 aspire to professionally-oriented occupations, nine contemplate jobs in the technical-skilled categories, four aspire to protective occupations, and the remaining 11 cover a wide variety of non-professional occupations. As will be noted in Table 2.1, most of the women aspire to careers as housewives.

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[1] Although only 106 subjects were interviewed, current status information was available for 109 subjects.

Table 2.1: High School + 4 Years Actual Occupations and Occupational and Educational Aspirations

			Males	
Code	E*	Actual Occupation	Occup. Aspirations	Educ. Aspirations
001	1	Military	Police Detective	Police Academy
002	0	Military	Business Field	College
003	4	Student	Bus. Management	Grad. School
004	3	Student	Law	Law School
005	2	Salesman	Gemologist	College
006	1	Salesman	Salesman	None
007	4	Student	Corp. President	Law School
008	4	Student	Banking	Grad. School
015	1	Military	Criminologist	Grad. School
016	1	Computer Operator	Computer Programmer	College
017	0	Clerk	Own Garage	None
018	3	Student	Psychologist	Grad. School
019	1	Student	Own Business	Law School
020	0	Military	Printer	Technical Courses
021	0	Bank Teller	Fire Dept.	None
028	0	Clerk (Pkg. Sorter)	Personnel Work	College
029	4	Student	Teacher	Law School
030	1	Military	None	College
031	2	Clerk (Pkg. Sorter)	Teacher	College
032	4	Student	Dentist	Grad. School
033	4	Student	Exec. Management	Grad. School
040	1	Military	Bus. Administration	College
041	3	Student	Teacher (Phys. Ed.)	Grad. School
042	1	Military	Flight Management	Airlines School
043	2	Student	Marketing	College
050	1	Military	Electronic Engineer	College
051	0	Shipper	Shipper	None
052	1	Draftsman	Draftsman	2 Yr. College
053	1	Bank Clerk	Accountant	Crses. in Accntng.
054	1	Military	Programmer	IBM Courses
055	2	Student	Journalism	College
056	1	Bank Teller	Bank Vice President	None
057	2	Military	Movie Photographer	College
064	0	Musician	Tradesman	None
065	1	Machine Operator	Computer Dept. Super.	Vocational Courses

*E - Actual educational level
0 - HS or less
1 - 1 yr. post H.S.
2 - 2 yrs. post H.S.
3 - 3 yrs. post H.S.
4 - 4 yrs. post H.S.

Table 2.1
(continued)

Code	E	Actual Occupation	Occup. Aspirations	Educ. Aspirations
066	1	Military	Machinist	Vocational Courses
067	4	Student	Teacher	Grad. School
068	1	Salesman	Buyer	None
069	0	Salesman	Pub. Co. Exec.	Misc. Courses
076	0	Research Technician	Bank President	Misc. Courses
077	1	Insur. Accntng Clk.	Accountant	College
078	0	Military		
079	1	Military	Science Field	College
080	1	Production Operator	Electronic Technician	Vocational Courses
081	0	Factory Worker	Crane Operator	None
090	0	Owner, Fuel Oil Bus.	Auto Repair Business	Vocational Courses
092	1	Military	Bus. Management	College
093	3	Student	Bus. Mgmt./Law	Grad. School
095	0	Gas Station Attdnt.	Fire Dept. Captain	Misc. Courses
096	3	Salesman	Electronic Engineer	College
099	2	Suudent	Electronic Techcn.	2 Year College
100	4	Student	Electronic Engineer	Grad. School
102	4	Student	Business Executive	College & Trng. Program
104	1	Military	Personnel Mngmt.	Unspecified Schooling
106	4	Student	Pharmacology	Grad. School
108	1	Military	Electronic Techcn.	None
110		Deceased		
			Females	
009	4	Student	Hsewfe./Business	Grad. School
010	4	Student	Hsewfe./Teacher	College
011	2	Office Clerk	Social Worker	College
012	4	Student	Hsewfe./Counselor	College
013	2	Housewife	Housewife	None
014	2	Jr. Accountant	Social Worker	Grad. School
022	0	Clerk	Clerk	None
023	0	Housewife	Housewife	None
024	0	Teletype Operator	Jr. Secretary	Misc. Hobby Crses.
025	1	Secretary	Hsewfe./Secretary	Misc. Crses.
026	0	Sr. Clerk/Steno.	Housewife	None
034	3	Hsewfe./Nurse	Nurse Supervisor	Misc. Crses.
035	0	Housewife	Hsewfe./Clerk	Misc. Crses.
036	1	Secretary	Housewife	None
037	3	Student	Foreign Service	Grad. School
038	3	Student	Secretary	Misc. Crses.
039	4	Student	Teacher	Grad. School
044	1	Bank Teller	Hsewfe./Asst. Mgr. Bank	None

Table 2.1
(continued)

Code	E	Actual Occupation	Occup. Aspirations	Educ. Aspirations
045	3	Dental Hygienist	Hsewfe./Dent. Hyg.	College
046	1	Housewife	Housewife	Misc. Crses.
047	1	Housewife	Housewife	College
048	2	Housewife	Hsewfe./Exec. Sec.	None
049	0	Clerk-Typist	Sec./Hsewfe.	Misc. Crses.
058	0	Housewife	Hsewfe./Med. Sec.	Vocational Crses.
059	0	Clerk/Housewife	Housewife	None
060	1	Lab. Technician	Funeral Director	Embalming School
061	0	Unemployed		
062	1	Singer	Hsewfe./Sales	Vocational Crses.
063	1	Dental Assistant	Hsewfe./D.A.	Misc. Crses.
070	0	Clerk	Accountant	Accounting Crses.
071	0	Clerk/Housewife	Housewife	None
072	0	Clerk/Housewife	Hairdresser/Hsewfe.	Vocational Crses.
073	0	Clerk/Housewife	Computer Programmer/ Housewife	Vocational Crses.
074	0	Housewife	Hsewfe./Office Wrk.	High School Crses.
075	0	Housewife	Hsewfe./LPN*	LPN Training
082	0	Housewife/Nurse's Aide	Hsewfe./LPN	LPN Training
083	0	Production Operator	Housewife	None
084	1	Secretary/Housewife	Housewife	Misc. Courses
085	1	Legal Secretary	Hsewfe./Sec.	None
086	1	Housewife	Hsewfe./LPN	LPN Training
087	0	Housewife	Housewife	None
088	1	Clerk	Clerk	None
089	3	Nurse	Nurse/Hsewfe.	None
091	0	Clerk/Housewife	Hsewfe./Sec.	None
094	0	Secretary	Housewife	Misc. Courses
097	3	Nurse	Hsewfe./Nurse	College
098	4	Student	Teacher	Grad. School
101	0	Clerk/Housewife	Hsewfe./Tailor	Vocational Crses.
103	1	Nurse's Aide/Hsewfe.	Hsewfe./Nurse	Nursing School
105	0	Clerk/Housewife	Receptionist/ Housewife	None
107	2	Clerk	Housewife	None
109	1	Ballet Dancer	Dancer	Dance Lessons
111	0	Housewife/Waitress	Hsewfe./Leg. Sec.	Misc. Courses

*Licensed Practical Nurse

Of the 34 aspiring housewives, however, 22 also contemplate occupations outside the home on a part-time basis or when the children are in school. Eight women aspire to professionally-oriented occupations.

An examination of the actual education attained at HS+4 indicates that 73 subjects are or have been involved in some post-high school education or training. Of this number 36 have completed one year, 11 subjects two years, 11 three years, and 15 were completing their fourth year of college. Thirty others graduated from high school and four have completed from eight to eleven years of schooling.

Table 2.1 also lists the educational aspirations of the group and indicates a larger number of males than females continuing to aspire to higher education. It must be noted, however, that this table does not reflect the three women who have already completed two or three year training programs and have, therefore, achieved their goals.

Table 2.2 compares actual HS+4 status and aspirations for Roe Level and Group. When the men's actual positions are compared with their verbalized occupational preferences, it is apparent that there is an upward trend in Group 3 and a downward trend in Group 4. When Levels are examined, an upward surge is noted in Level 2 and a decrease is noted in Level 4. All Groups (except 9, the student category) are represented in the aspiration column, indicating a much wider spread than is evident in the actual column.

When the women's actual positions are compared with their aspirations, however, there is noted a decrease in Group 3 and an increase in Group 0; and an increase in Level 4 and a decrease in Level 5.

Actual HS+4 occupations and occupational aspirations were rated according to Hamburger's Revision of Warner's Scale. An examination of Table 2.3 shows that, with the exception of Level 7, there is a good distribution of subjects across socioeconomic levels. The preponderance of males at Level 1 can be accounted for by the male students who are presently enrolled in college. The high percentage of women at Level 5 is due to housewives (an arbitrary classification because Hamburger does not include housewives) and clerical occupations. Levels 2 and 3 show marked increases from actual occupation to aspirations, indicating a desire to move upward in the level of occupation.

Another way of examining mobility is to compare the subject's occupational preference at HS+4 with his father's occupation, both of which have been rated on the Hamburger scale. Without regard to sign, the subject's score was subtracted from the father's score, resulting in a discrepancy score. Table 2.4 indicates that 64 of

Table 2.2: Roe Level and Group for High School + 4 Years Occupations: Actual and Aspirations

Roe	Men		Women		Roe	Men		Women	
Group	Actual	Asp.	Actual	Asp.	Level	Actual	Asp.	Actual	Asp.
0	0	1	15	34	0	0	0	0	0
1	0	3	0	1	1	0	4	0	0
2	0	3	0	3	2	19	32	9	8
3	16	25	22	7	3	7	9	5	3
4	20	11	1	1	4	17	6	21	38
5	0	1	0	0	5	10	3	15	3
6	1	4	6	3	6	3	0	2	0
7	0	6	0	2	7	0	1	1	0
8	1	1	2	1		56	55	53	52
9	18	0	7	0					
	56	55	53	52					

Roe Occupational Groups

0 Unemployed, No asp., Hsewfe.
1 Physical
2 Social and Personal Service
3 Business
4 Industry and Government
5 Math and Physical Sciences
6 Biological and Medicinal sciences
7 Education and Humanities
8 Arts
9 Student

Roe Occupational Levels

1 High Professional and Managerial
2 Professional and Managerial
3 Semi-Professional and Low Managerial
4 Skilled Support and Maintenance
5 Semi-skilled Support and Maintenance
6 Unskilled Support and Maintenance
7 Unemployed, No aspiration

the 106 subjects are found in the 0 and 1 categories, indicating no or slight discrepancy. The remaining 42 subjects had discrepancy scores of two or more SES levels. Although not shown in the table, it is interesting to note that when signs were considered only 24 aspired to occupations lower than their fathers' and 15 of these were girls who aspired to clerical-sales or housewife. The tendency of the group as a whole is toward upward mobility.

Table 2.3: HS + 4 Socioeconomic Status: Actual and Aspiration *

Actual Occupation				Occupational Aspiration			
SES	MALE	FEMALE	TOTAL	SES	MALE	FEMALE	TOTAL
1	14	4	18	1	13	0	13
2	3	3	6	2	12	9	21
3	2	5	7	3	5	11	16
4	13	11	24	4	7	9	16
5	2	28	30	5	1	23	24
6	6	1	7	6	2	0	2
7	0	1	1				

*Military men have been omitted from this analysis.

Students' actual occupation rated on educational aspirations - o.e. if stated graduate school rated 1.

Women - if full time housewife rated 5 - if worked the occupation was rated.

Aspirations for women - if aspired to occupation in future the occupation was rated - otherwise rated as housewife.

Table 2.4: Socioeconomic Mobility

Discrepancy *	Frequency
0	22
1	42
2	22
3	14
4	4
5	2

*Discrepancy score is the difference between the Hamburger scale rating of the subject's HS + 4 occupational preference and the father's occupation.

The sample has been geographically stable with 83 of the subjects continuing to reside in their original towns, 16 have moved elsewhere in Massachusetts, and 10 have moved out-of-state.

Thirty-nine subjects have married, 16 males and 23 females; and there have been four divorces, one male and three females. Eleven of the subjects were engaged to be married in the near future.

The actual status of the group four years out of high school indicates that the group is confined to rather narrow occupational categories, but in terms of aspiration the group spreads out to cover most of the major occupational categories. Also apparent in terms of Roe Level and SES status is the desire to strive for upward mobility.

2.3 Correlates of Educational Aspirations

In this section we will deal with some of the forces which affect the young person as he meets and deals with vocational decisions in the career development process. Curriculum, intelligence, socioeconomic class, place of residence, and military service will be examined to determine their relationships to educational aspirations elicited from our subjects at each of the five interviews over the nine-year period.

1. Educational Aspirations

It is clear from Table 2.5 that there is a definite downward trend for the total group over the nine years, with a sharper decrease noted for the girls (50%) than for the boys (26%). It is also clear that the percentage of boys aspiring to college far outnumbers the percentage of girls aspiring to college.

The increase noted in the 1 - 2 year category is inflated by the many subjects who said they intended to take a course or two but had no particular educational goal in mind.

2. Curriculum Election

An examination of Table 2.6 indicates that 14 of the 15 subjects presently enrolled in the fourth year of college were enrolled in the college preparatory curriculum in the 12th grade, and 13 of the 15 stated preferences for that curriculum at the eighth grade. Of the eight other students who are in varying stages of completing four year programs, four consistently chose college preparatory and the remaining four alternated between college preparatory and the other curricula. In addition, of the 22 students presently included in the two-three year category, 18 chose college preparatory in grade eight, and 19 were actually enrolled in that curriculum in grade 12. To some extent then,

Table 2.5: Educational Aspirations - 8th, 10th, 12th Grade HS+2 and HS+4 Frequencies

	Eighth Grade			Tenth Grade			Twelfth Grade			H.S. + 2			H.S. + 4		
Aspiration	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total
College	42	22	64	34	18	52	31	15	46	33	17	50	31	11	42
3 years	1	6	7	5	6	11	1	4	5	5	1	6	0	1	1
2 years	6	12	18	10	22	32	12	15	27	10	15	25	15*	23*	38
High School or less	8	14	22	8	8	16	13	20	33	9	21	30	9	17	26

*Includes 1-2 years

Table 2.6: 8th and 12th Grade Curriculum vs. Actual Education at H.S.+4 (8th grade curriculum outside brackets - 12th grade curriculum within brackets

	H.S. +4 Actual Education											
	4th year of college		3 years		2 years		1 year		High School		Total	
Curriculum	M	F	M	F	M	F	M	F	M	F	M	F
College	9 (9)	4 (5)	4 (4)	5 (5)	6 (6)	3 (4)	15 (9)	7 (7)	3 (5)	12 (1)	37 (33)	31 (22)
Business	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (1)	2 (4)	8 (5)	7 (2)	7 (21)	9 (6)	16 (28)
I.A. & Gen'l	0 (1)	0 (0)	0 (1)	0 (0)	0 (0)	0 (0)	0 (4)	0 (1)	0 (2)	1 (1)	0 (8)	1 (2)
Don't Know	1 (0)	1 (0)	1 (0)	0 (0)	0 (0)	2 (0)	1 (0)	0 (0)	2 (0)	0 (0)	5 (0)	3 (0)
Drop Out									1 (3)	0 (2)	1 (3)	0 (2)

these data support Ginzberg's theory that occupational choice is an irreversible process, i.e., only one of our subjects was able to overcome the handicap of being in the "wrong" curriculum at grade 12. However, the reverse does not obtain in that many college preparatory subjects did not enter college and this choice of curriculum did not prevent them from entering other fields which require less than a four-year program. We feel that the educational system which forces a youngster to commit himself to a curriculum choice at grade eight or nine has the responsibility of insuring that the youngster is ready and able to make this decision, and that insofar as possible, it will encourage him to choose that curriculum which will give him the greatest freedom of choice in the future. (Perhaps this means that almost all students should take a college preparatory curriculum.)

3. Intelligence

When the relationship between intelligence and level of educational aspirations (Table 2.7) is studied over the nine-year period, it is interesting to note that both sexes in the 121 plus IQ college aspirers demonstrate extremely high consistency. The shift to "No Plans" is accounted for by three girls who are married, one girl who completed a three-year nursing course, and one man in the military who anticipates taking a "few courses."

The 111-120 IQ group demonstrates a marked lowering (16 to 8) of aspirations from grade eight to high school plus fours years (HS+4) but a strong consistency between grade twelve aspirations and HS+4. The 101-105 group and the 106-110 group are much more consistent than the below 100 IQ group, which showed a rather dramatic drop from 13 subjects aspiring to college at grade eight to two aspiring to college at HS+4. This lowering of educational aspirations would seem to be a move in the direction of more realistic aspirations, but the loss of 17 subjects with college aspirations in the 111-120 and the 121 plus IQ groups would seem to be a loss to the body of college-trained manpower. It seems that intelligence has a relationship to consistency, but it cannot account for the educational aspirations of many of our subjects.

4. Socioeconomic Level

When socioeconomic level was rated by Hamburger's Revision of Warner's Scale, all major occupational groups were found to be included among the parents of the students--from Level 1 (high level) to Level 6 (lowest level)--and there was a tendency for the occupations to fall at the middle of the scale. Examination of Table 2.8 reveals a positive relationship between high level socioeconomic class and college aspirations--15 of 18 members of Level 1 consistently aspired to college--and a tendency for boys to have higher aspirations than do the girls. The remaining levels all showed a decrease in the level of educational aspirations. Level 4 has the most marked drop with eight of 16 boys and two of five girls lowering their aspirations.

Table 2.7: Educational Aspirations and IQ Group Frequencies

10 Range	Ed. Plans	Eighth Grade		Tenth Grade		Twelfth Grade		H.S. + 2		H.S. + 4	
		M	F	M	F	M	F	M	F	M	F
100 and Below	College	7	6	7	3	7	1	4	2	1	1
	2-3 Years	3	2	3	6	1	5	6	4	2	0
	No Plans	4	3	4	2	6	5	4	4	10	10
101-105	College	8	2	7	2	5	3	8	3	8	2
	2-3 Years	2	5	4	6	6	3	2	2	0	1
	No Plans	2	3	1	2	1	4	2	5	4	7
106-110	College	10	2	6	1	6	1	7	1	8	1
	2-3 Years	1	7	4	10	2	3	4	4	0	0
	No Plans	1	3	2	1	4	8	1	7	4	10
111-120	College	9	7	7	5	6	3	7	5	6	2
	2-3 Years	1	1	2	5	3	7	3	4	0	0
	No Plans	0	4	1	2	1	2	0	3	3	9
121 Plus	College	8	5	7	7	7	7	7	6	8	5
	2-3 Years	0	3	2	1	1	1	0	1	0	0
	No Plans	1	1	0	1	1	1	2	2	1	4

Table 2.8: Socioeconomic Status and Educational Aspirations at HS+4 (8th grade curriculum outside brackets - 12th grade curriculum within brackets)

	Curriculum							
	College		2-3 years		1 year		H.S. or less	
SES	M	F	M	F	M	F	M	F
1	9 (9)	3 (2)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	1 (2)
2	4 (3)	2 (1)	1 (0)	2 (0)	0 (2)	0 (3)	0 (0)	0 (0)
3	3 (3)	6 (3)	1 (0)	3 (0)	0 (1)	0 (2)	0 (0)	1 (4)
4	16 (8)	5 (3)	2 (2)	4 (1)	0 (6)	0 (1)	2 (2)	2 (4)
5	6 (5)	3 (0)	2 (0)	4 (0)	0 (1)	0 (6)	2 (3)	3 (4)
6	4 (2)	3 (1)	1 (0)	4 (0)	0 (1)	0 (6)	3 (3)	6 (3)
7			0 (0)	1 (0)	0 (1)	0 (0)	1 (0)	0 (1)

An examination of intelligence test score results and SES level (Table 2.9) indicates that, with the exception of Level 6, the average IQ of the college aspirers is consistently higher than that of the non-aspirers. This would support the position that intelligence is an important factor in determining those who will aspire to college. However, when SES Levels 5 and 6 are examined, it is found that the 11 subjects in these two classes have an average IQ of 110 (range 91-123), indicating that at least half of this group might be expected to have a chance of success in college and all have lowered their aspirations dramatically from grade eight to HS+4. In addition to this group, we find that 10 of the 17 subjects in the 111 plus IQ group who also lowered their aspirations are from Levels, 4, 5, and 6; five are from Level 3, and there is one each from Level 1 and 2. How does this group of non-college aspirers compare with the 111 plus college aspirers? Fifteen of the 21 college aspirers are in Levels 1, 2, or 3; four are in Level 4; and two are in Level 2. These data suggest that socioeconomic level does indeed influence whether a young person will persist in his aspirations for higher education, and we feel that it is not unreasonable to question whether more effective counseling could be instrumental in helping youngsters in the lower socioeconomic groups to realize their ambitions by giving them the extra incentive and information (e.g., work programs, scholarships, loans, etc.) they may not be receiving in their homes.

Table 2.9: IQ and HS+4 Educational Aspirations (8th grade aspirations outside brackets - 12th grade within brackets)

	Educational Aspirations					
	Aspire to college			Non college aspirers		
SES	M	W	Ave. IQ	M	W	Ave. IQ
1	9 (9)	3 (2)	114	0	2	91
2	4 (3)	2 (1)	112	1	0	103
3	3 (3)	6 (3)	117	0	3	112
4	16 (8)	5 (3)	109	7	1	99
5	6 (4)	3 (0)	111	2	3	108
6	4 (2)	3 (0)	102	2	4	111

5. Place of Residence

Hamburger's classifications were used again to investigate the question of whether place of residence has any effect on aspiring and fulfilling aspirations to higher levels of education.

Examination of Table 2.10 reveals that cities A and B fall into the lower half of the SES (using 3.5 as the dividing point, C and E fall into the upper half, and D has one school in the lower half and one school in the upper half of the scale. It is quite apparent that the number of college aspirers at grades eight and twelve is much greater in the upper SES towns; and an even wider disparity is noted when one examines the actual educational level attained in HS+4. It is, of course, impossible to attribute these results to any one particular environmental force, but it does seem that SES status of both the family and the place of residence play some part in determining the aspirations of the products of these families and towns.

Nineteen of our male subjects (no information on one serviceman) have served or are serving in the armed forces. Some interesting trends are noted when we compare their educational aspirations at grade twelve with those at HS+4. Nine of the men raised their aspirations during this period (six to college), three lowered their sights--seemingly realistically because of IQ's of 98, 97, and 111--and six remained unchanged. Of the six who remained constant, four were college bound. These raised aspirations seem especially remarkable because we would consider grade twelve to be a clear cut-off point

Table 2.10: 8th & 12th Grade Educational Aspirations and Actual Education by Towns

			Educational Aspirations*				Actual Education			
Town	N	Ave. SES	College	2-3 Yrs.	1 Year	H.S.	College	2-3 Yrs.	1 Year	H.S.
A	13	5.1	2 (3)	0 (1)	5 (4)	6 (5)	0	1	2	10
B-1	12	4.6	8 (3)	1 (0)	0 (4)	3 (5)	1	0	3	8
B-2	12	5.5	7 (1)	1 (0)	4 (8)	0 (3)	0	2	8	2
C	14	2.7	13 (11)	0 (0)	0 (0)	1 (3)	6	5	1	2
D-1	12	4.1	4 (2)	0 (1)	4 (5)	4 (4)	0	0	6	6
D-2	23	3.5	13 (11)	3 (1)	3 (5)	4 (6)	4	6	6	7
E	24	3.2	16 (13)	2 (1)	2 (7)	4 (3)	4	8	9	3

* Grade 8 = Outside Brackets
Grade 12 = Inside Brackets

for decisions about college attendance. That is, if one has not made definite plans by that time, it would seem unlikely that college could be considered a realistic possibility. However, it seems that the time served in the military service provides some kind of buffer zone in which one can reanalyze one's plans before absolute commitment of self to a job. In addition to this, of course, is the very important financial aid to education offered to veterans of the armed forces. It will be interesting to follow up young veterans and later compare their progress with other young men who did not have the experience of military life and veteran benefits.

Our comparisons in this section of educational aspirations and the several variables have raised some interesting and, at times, disturbing trends. Our sample is limited in size and we do not intend to urge generalizations in any definitive form. We hope rather that we have suggested problems which can be further investigated with larger and more representative samples. Our data suggest that intelligence, social class, place of residence, and military service have joint effects on educational aspirations and attainment. It was disturbing to find how often our brighter students from less affluent families or towns failed to follow through on their educational aspirations of early years, but encouraging to note that military service may lead to aspirations for higher attainment with some of our young men.

2.4 Vocational Maturity at Grade Twelve[1]

Although most analyses contained in this chapter are based on our high school plus four years data, we include a study just completed of the vocational maturity of our subjects at grade twelve, using a set of behavior characteristics not previously treated in depth in our research. This exploratory stage in career development is extremely important because it is at this point, career psychologists theorize, that the individual is crystalizing his vocational preferences and is about to commit himself to specific educational-occupational decisions which will vitally affect his future.

Vocational behavior characteristics of the exploratory stage can be categorized as search, experimentation, investigation, and trial. Their locus has been termed "self in situation" (Tiedeman, 1963) and their essential purpose is to test the validity of some hypothesis or expectation about the self or the environment. Such behaviors include: searching for an appropriate outlet for one's interests and values; experimenting with adult vocational roles; seeking opportunities to demonstrate abilities, trying out new activities, orienting oneself to new situations and striving for independence. (Super, *et al.*, 1963) When these activities are undertaken with the hope of eliciting information about oneself or one's environment they become a means to increased self knowledge and increased ability to relate this knowledge to future objectives.

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[1] Miss Catherine Lee of Regis College is co-author of this section.

Vocational maturity of the exploring adolescent should also be evidenced in his basic attitudes and perceptions. Satisfaction with a choice, confidence in plans, and enthusiasm over future prospects together with a congenial vocational self concept are signs that the individual is dealing with his vocational tasks successfully.

A favorable outcome of the process of explorations and hypothesis-testing should result in a realistic, integrated self concept and clear formulation of objectives. The individual should be able to relate his special abilities, interests and values to an occupational goal, clearly understanding why these personal attributes are at the bases of sound decisions. Formulation and implementation of specific plans for attaining this objective can then be carried out successfully.

In order to understand emergence of the vocational self concept and assess career development, it is necessary to arrive at an operational definition for vocational maturity. This can be accomplished by a multi-variable approach similar to that described by Super (1963). Vocational maturity is conceived in terms of coping behaviors and attitudes which are instrumental in the formation of an integrated vocational identity and appropriate career objectives. These have been termed the dimensions of vocational maturity. For the purposes of this study, five dimension variables were selected because their contribution was felt to be essential to career development during the exploration years. They reflect the importance of an integrated value system, a sense of agency, and a feeling of high morale and self esteem as attitudes and beliefs which are central to a vocational self concept. The significance of role playing experiences and an understanding of the importance of informative advice were also explored as part of the process of career development.

1. Values

At the basis of every career decision, there is a hierarchy of personal values which organize judgments, attitudes and perceptions within the individual's self concept, and muster them for decision making. Values may be considered culturally influenced expressions of needs and the motivated reasons for which interests and goals are sought.

The source of an individual's value system is frequently the home. Family expectations, attitudes and roles, as well as socioeconomic status influence the child's ideals and aspirations. Peer groups, especially during adolescence, are a major force in determining valued goals. However, since values are intimately related to inner psychological and physiological drives, their primary determinant is the person himself. Ginzberg (1951) has classified values as they relate to occupational preferences into three types: 1) related to the work activity itself; 2) related to the returns of work, as exemplified by pay and the way of life a job permits; or 3) related to the concomitants of work, what is associated with the job such as coworkers and supervisors. The individual must be able to relate his "work" values to an appropriate career goal. Capacities and interests must also be considered, but it is the value scheme which mediates an effective choice.

In crystallizing and implementing a career, the individual must relate his value hierarchy to the realities of environmental limitations. This process required compromise between competing values and between values and opportunities. The value system is temporarily thrown out of balance and change is necessitated. This alteration of values to eliminate contradictions between hopes and expectations is a necessary part of maturation and must occur before an individual can chose effectively.

Vocational maturity is evidenced in realistic appraisal of the personal value scheme in relation to future objectives. This study has sought to probe the student's awareness of values and their importance in career decision making. Information about valued activities and ideals must be understood as factors in occupational choice. If the individual knows what satisfaction he wants out of life and work, he is better able to set his course for a goal which will satisfy these values. Katz (1963) defines the value system as "the synthesizing element that orders, arranges and unifies such interactions, that ties together an individual's perceptions of cultural promptings, motivating needs, mediating symbols, differentiating characteristics, and sense of resolution that relates perceptions to self-concepts and that accounts most directly for a particular decision or for a mode of choosing." (p. 16) It would seem that effective occupational choice is impossible without the support of values.

2. Sense of Agency

In addition to understanding the factors on which decision making should be based, the individual must possess a functioning belief that he can choose. This "awareness that he is an active agent in determining the course of his own career" is termed sense of agency. (Tiedeman, 1967) Sense of agency can be an attitude and an action. It is revealed first of all in self esteem; the person must be confident of his abilities and be able to realistically set his goals and limits. This confidence in self is basic to operating as an agent; "the individual must above all like himself . . . or his potential for manifesting agency behavior will remain latent." (Pincus, 1967, p. 3) Self direction and personal independence are also part of agency. The individual should display self reliance, active involvement in directing his career, and satisfaction in making his own judgments. Finally, the self-directed individual is "committed"; he accepts responsibility for making a decision and seeing his plans through.

Agency is displayed by the individual who is satisfied with the choices he has made in the past and who is busy formulating specific plans to reach his occupational goal. He accepts "his assets and his liabilities in a realistic way, a way that does not hinder his performance" and realizes "his worth as an individual and is ready to capitalize on it." (Pincus, 1967, p. 4) The student's readiness and ability to engage in career choice and to evaluate, modify and achieve goals based on this choice is a basic criteria of career development.

3. Role Playing

"The complex self concept is organized within the framework of a role." (Super, 1963, p. 18) One of the major vocational tasks of the adolescent is to explore the roles he may be expected to play and the opportunities to play roles which suit his personality, interests, and abilities. Role playing is carried on with the purpose of gaining information about the validity of some self concept; it is what Jordan calls hypothesis-testing.

Role playing begins with identification. The child who identifies with some significant adult strives in various ways to be like him. Eventually such identification becomes differentiated into occupational roles which can be tried out in fantasy and play. During adolescence, role playing comes to have more significance. The student who aspires to be a research scientist takes part in science fairs and laboratory classes with this role in mind. Whether these roles are played in imagination, discussion, or are actually participated in; they give some opportunity to try the role for size.

Role playing becomes reality testing when it is pursued in the "hope of eliciting information about oneself or one's environment, or of verifying or arriving at a basis for a decision." (Super, _et al._, 1963, pp. 57-58) It is a trial in which the individual tests his performance in a role and discovers how well it agrees with his values and aptitudes. This also leads to greater understanding of the opportunities and expectation of various occupational roles and familiarizes the individual with alternatives that are open to him.

Students evidence occupational role playing by participating in school classes, clubs, part-time jobs, in thoughtful discussion about careers and even in daydreaming. The ability to relate experiences in roles to one's abilities, values and goals is an indication of vocational maturity.

4. Morale

Compromise between preferences and expectations is an essential part of the process of occupational choice. If the individual is able to realistically appraise his interests, abilities, values, strengths and weaknesses; and is able to relate this knowledge of self to future objectives, the confrontation between self concept and reality should be facilitated and prove satisfying. However, the individual who has not learned to deal with the developmental tasks of his career and has not achieved an integrated realistic self concept will be unprepared to face limitations imposed by environment. Poor planning, over-or-underestimation of abilities, and lack of information about opportunities leaves the individual with the single alternative of drifting into a potentially unsuccessful career. The result of all this will, of course, be disappointment, frustration, and depressions which will soon be reflected in all other aspects of the person's life. While low morale might be the result of overwhelming circumstances, this is the exception to the rule. Morale, thus, is an indicator of the past success, the present progress, and the future prospects of an individual's career.

Vocational maladjustment, like other emotional disturbances, is a symptom of inability to cope with the problems of reality. Feelings of inevitability, uncertainty, and lack of enthusiasm are certainly not to be considered typical vocational attitudes in people who are about to face the challenges of the working world. The vocationally mature person is the one who expresses satisfaction with his career and with his total picture of himself.

5. Key Person

"Central in decisions about occupations, jobs, or courses of study are facts about one's self and about work." (Tiedeman, 1967, p. 2) The individual is expected to use these facts to generate relevant information about those goals and alternatives which are most compatible with the self concept. "The quality of decisions is ordinarily directly related to the quality and comprehensiveness of the information possessed by the decision maker. Even the most purposeful person is limited in a decision by the lack of complete information." (Tiedeman, 1967, p. 11)

The aware student realizes that, although the execution of a vocational decision is his responsibility, informed and experienced adults can help him to realize his full potentiality. Guidance counselors in the school are not only able to provide facts relevant to courses, training, and occupations; but they are also able to aid the student in translating these data into relevant information. In addition, people working in preferred occupations, students in a relevant training program, and other informed adults can provide valuable insights.

The student who does not take advantage of the aid these people can offer and who has not yet learned the role of information in vocational decisions has no means of coping with his developmental tasks. Accurate and comprehensive information about alternatives and consequences obtained from reliable sources and informed adults is a key to career success.

6. Vocational Maturity Scoring Criteria

One hundred six 12th grade protocols (four interviews were eliminated for various reasons) were read in their entirety and questions were selected which were felt to measure each of the five 12th grade vocational maturity scales (VM12):

1. Values

   Questions 5, 7, 19, 22, 28, 30, 32, 33

2. Sense of Agency

   Questions 4, 13, 22, 26, 39

3. Role Playing

   Questions 6, 8, 29, 31, 34, 35, 45

4. Morale

   Questions 43, 44, 46, 52

5. Key Person

   Questions 3, 12, 16, 17, 20, 25

The 12th grade interview schedule is reproduced in Appendix B.

Eight interviews, selected at random, were used in preparing the scoring manual reproduced in Appendix B. Responses from these protocols were studied, criteria for assigning scores were defined, and representative verbatim answers were selected to illustrate the quality of information expected for each scale. The main criteria for scaling were quality of response, accuracy of information, and awareness of an indicated dimension of vocational maturity. Emphasis was not on the occupation chosen, but on the reasons for the choice and the student's ability to relate his self appraisal to an appropriate goal. Responses which were indicative of average vocational maturity were scored 1 and expected to reveal understandings of the process of vocational decision making and integration of vocational information and choice. A score of 2 was given for responses which indicated superior maturity, highly adequate vocational coping behavior, and a well-developed decision process. Below average responses received a score of 0 and revealed little understanding of the importance of vocational choice or the factors on which it is based.

Questions 1, 2, 9, 10, 11, 14, 18, 24, 36, 37, and 38 supplied background material. They supplied general information concerning each student's high school curriculum, special test scores, educational plans, occupational goals, activities, and scholastic ability.

The scorer had a good understanding of the process of career development and was thoroughly familiar with the interview and the scoring manual. Only one VM12 dimension was scored at a time for each student protocol.

Reliability of Scales:

A formal reliability study was not undertaken because the generalizations behind the scales are very tentative and would not seem to justify the time and expense such a study would require. In an informal check of intra-judge reliability, however, the scorer rerated all interviews one week after the original scoring on two variables--Values and Sense of Agency--which had often presented scoring problems. About 90% of the scores agreed across trials and those which did not differ by only one point.

Results:

The mean scores (Table 2.11) for the 106 subjects indicate that the males earn slightly higher scores than do the females--6.5 vs. 5.9. Twenty-two males but only 11 females score in the 8 to 10 point range also indicating a slight edge on the part of the males to score higher on this 12th grade measure of vocational maturity.

When the individual scale scores are examined (Appendix B) it is quite clear that most of the scores, for both sexes, fall into the 1 to 2 point range, with Morale coming closest to a normal distribution of scores. It is also apparent that, with the exception of Sense of Agency, the males average scores are slightly higher on the individual 12th grade vocational maturity scales.

Although examination of Table 2.12 might suggest some slight relationship between IQ and VM scores, the evidence is far from clear. For example, 17 of 42 of 111 plus IQ students score in the high 12 VM range, but 13 of the same group fall at the lowest end of the scale. The overall results do not appear to indicate a strong relationship between VM and IQ.

There does appear to be a relationship between SES (rating of father's occupation according to Hamburger scale) and VM12.

Table 2.11: Distribution of VM12 Scores for Total Sample and for Males and Females Separately

Distribution for Total Sample

Score	N	Males N 54	Females N 52
0 - 5	36	16	20
6 - 7	37	16	21
8 - 10	33	22	11
Mean	6.2	6.5	5.9
S.D.	2.38	2.02	2.63

Distribution by Sex for 5 VM12 Scales

VM Score	Values		Sense of Agency		Role Playing		Morale		Key Person	
	M	F	M	F	M	F	M	F	M	F
0	3	6	7	5	4	7	9	7	8	7
1	31	27	25	26	26	23	29	38	17	22
2	20	19	22	21	24	22	16	7	29	23

Almost twice as many (12-5) subjects at high SES levels earned high VM scores, the reverse tendency is noted for low SES levels, and the middle SES subjects are spread quite evenly throughout the range of the ten point scale.

Twelfth grade curriculum enrollment seems to be related to VM scores; more college preparatory students earn high VM scores while Business and 1A-General students generally earn lower scores.

Examination of the 12th grade educational aspiration data indicates that far more college aspiring subjects score in the high range (19) than in the low range (10), and subjects with no educational aspirations beyond the 12th grade show a complete reversal of this pattern (6 high vs. 13 low).

Table 2.12: Distribution of VM12 According to Educational, Occupational, and Socioeconomic Class Variables

		VM12 Scores		
Variable	N	0 - 5	6 - 7	8 - 10
Intelligence				
111 plus	42	13	11	17
100-110	45	14	21	10
99 below	20	9	5	6
Socioeconomic Class Level				
1 - 2	24	5	10	9
3 - 5	60	21	19	20
6 - 7	22	10	8	4
Curriculum				
College Prep.	55	14	20	21
Business	34	15	12	7
IA - General	17	7	5	5
Educ. Aspir.				
College	45	10	16	19
Post High School	32	13	11	8
High School	29	13	10	6
Roe Levels				
2 - 3	64	12	26	26
4 - 7	42	24	11	7

Roe's levels of occupational aspirations were combined into two groups and it is quite clear that subjects who showed a preference for higher level occupations also score higher on the 12th grade measure of vocational maturity.

②

Discussion:

The instrument designed to measure 12th grade vocational maturity has demonstrated some interesting trends. Males, subjects in higher SES levels, college curriculum students, those aspiring to education beyond high school, and those aspiring to higher levels of occupations all score higher on this measure of vocational maturity. There does not appear to be a strong relationship between IQ and vocational maturity.

Because these results are based on an instrument whose reliability has not been established they must be considered as very tentative.

The authors feel, however, that they do suggest that 12th graders, on the average, are coping adequately with their vocational tasks, have come to understand the important factors in their decision making, and realize, at least tacitly, the need to integrate the self concept into the process of career choice. If one's self-concept conveys a picture of satisfaction and success in an occupational role, the individual is likely to initiate activities which will advance his goal and bring its implementation closer. The relationships which have been noted between vocational maturity and curriculum, social status, and vocational aspirations can be understood as part of this relationship. Seeing oneself as the product of an economically and socially successful home, as an educated and respected member of the professions is certainly more likely to stimulate career implementation than the expectations of a laborer's son who envisions his future as an inevitable repetition of his father's unhappy drudgery. This situation has important implications for counseling. Positive attitudes, self-understanding and a well-developed vocational repetoire are the means to vocational success; without them, all the ability and opportunity in the world are lost.

Seventeen is a fascinating age from which to view an emerging career for it is the time when the individual begins to sight his approaching goal and can feel his power over the future course of his career. He waits on the brink of so many important insights into his own self concept and into the process of implementing a vocational choice. In Super's (1963) words, this is the time when "young people explore the world in which they live, the subculture of which they are about to become a part, the roles they may be expected to play, and the opportunities to play roles which suit their personalities, interests, and aptitudes. It is at the same period in which the adolescent through experience and self-examination clarifies his self concept and begins to put it into words, finds out what outlets exist in society for one who seeks to play a given role, and modifies his self concept to bring it in line with reality. Adolescent exploration is, in this view, a process of attempting to develop and implement a realistic self-concept."

2.5 Relating Vocational Maturity in Early Adolescence to Nine-Year Career Patterns Criteria

In their 1957 framework for research on career development Super and his associates elucidated a construct they called vocational maturity. This construct has dominated the psychology of career development in the ten years since the publication of that crucial theoretical framework. The key word in Super's original exposition of the construct is "evaluation." The trait indicators of vocational maturity in adolescence require evaluation by the psychologist for the extent to which, in his judgment, they presage achievement of the goal of integrative vocational adjustment in adulthood. There is a "criterion of long-term efficiency in attaining satisfaction of socialized goals" (Super, et al., 1957, p. 70) which is the standard for rating adolescent behaviors for degree of vocational maturity. A recent extensive review of Super's Career Pattern Study has characterized that longitudinal research program as follows:

> Perhaps most important is the exposition of a dependent, or criterion, set of variables as the class of dimensions of integrative vocational adjustment. The basic research paradigm which emerges is to scale the independent variables as dimensions of vocational maturity by relating them to the dimensions of the criterion.
> (Cooley and Lohnes, 1968, pp. 4-15)

In short, the main justification of vocational maturity traits is to be their power as predictors of subsequent career adjustments. Published longitudinal research results have demonstrated weak but positive predictive powers for VM scales in the Career Pattern Study data (Super, et al., 1968) and in the data of the parallel Career Development Study (Gribbons and Lohnes, 1968). This report extends the results of the latter study to data collected four years after the 111 male and female subjects graduated from high school, or nine years after the initial interviews in the eighth grade.

The initial eighth grade data of the Career Development Study were collected by interviewing in 1958. The nine-year followup data were collected by interviewing and inventorying in 1967. All analyses referred to here as previously reported can be found in Emerging Careers (Gribbons and Lohnes, 1968). In the eighth grade data, vocational maturity was treated as a syndrome of eight moderately correlated traits, called as a set Readiness for Vocational Planning (RVP). The eight 1958 RVP scale scores of the subjects are related to several career patterns criteria in this report. However, a continuing research problem for the CDS has been the artificial over-determination of the subjects by the predictors, especially since this has prevented the teaming of other interesting predictor variables, such as intelligence, with the vocational maturity scales. There simply are not enough degrees of freedom made available by 111 subjects to convincingly relate eight-plus predictor scales to criteria, particularly if the criterion variable is a taxonomy in several categories. Classification criteria have had to be forced into dichotomies, frequently with real loss of meaning. Therefore, a major objective of this report is to explore the possibility of recovering degrees of freedom by substituting a univariate treatment of vocational maturity for the RVP syndrome. The new univariate scaling is called Readiness for Career Planning (RCP). The 22 items selected by factor analysis procedures from the original 45 items of the eighth-grade interview and scored for RCP are listed in Table 2.13. It is hoped that the retreat to a single scale for a subset of the 9158 VM indicators will be justified by the opportunities it creates to team a VM measure with other predictors and to employ more detailed taxonomic criteria.

The additional predictors from early adolescence to be incorporated with RCP are sex, socio-economic status, and intelligence. Table 2.14 contains the intercorrelations among these variables, and their means and standard deviations, for the eighth-grade data. The strongest relationship among the four variables is a moderate tendency for intelligence to increase with increasing socioeconomic status of family. RCP is not significantly correlated with sex or socioeconomic status, and its correlation with intelligence is modest. This .31 correlation can be compared with the previously reported multiple correlation of the eight RVP scales with intelligence of .57, which suggests that the RCP scale is perhaps freer of contamination with intelligence that are the RVP scales as a set. Anyway, these four relatively independent predictors seem to represent a suitably parsimonious yet potentially powerful antecedent measurement space for a longitudinal study with the modest sample size of the CDS.

The criterion scaling problem has been a bugaboo which the CPS and CDS have attempted to reduce through a series of approximations of assorted worthiness. It is one thing to speak philosophically of the goal of integrative vocational adjustment. It is another thing to choose operational indicators of progress toward this panacea. Similarly, it is easier to talk about career patterns than to decide how to quantify them for research manipulations. In order to evaluate a trend in a subject's vocational adjustment it is necessary to look simultaneously at data from at least two points in his life history, so that what is evaluated is a transition from time 1 to time 2. Super (1963) has defined a set of five coping behaviors that seem to represent the best available rubric for evaluating transitions in career development data. These coping behavior categories are 1) floundering, 2) trial, 3) stagnation, 4) instrumentation, and 5) establishment. Since the CDS subjects have been interviewed five times at two-year

Table 2.13: Eighth-grade Interview Items Scored for Readiness for Career Planning (RCP)

1. What curricula are there that you can take in the 9th grade?
2. Why did you decide to take ________ curriculum?
3. Why did you decide not to choose one of the other curricula?
4. Why did you decide not to choose a second of the other curricula?
5. Is there any advantage to taking the college curriculum?
6. Are there advantages in taking the other curricula?
7. What facts should you know about yourself before you choose a curriculum?
8. How can you predict your chances of success in different courses for next year?
9. Is there any advantage to taking algebra?
10. Why would you like to become a ___(first choice)___?
11. What facts should you know about yourself before choosing an occupation?
12. How much education is required to be a ___(first choice)___?
13. What does a ___(first choice)___ do at work?
14. What connections do you see between the subjects you'll be taking next year and the work you want to do later on?
15. Which abilities do you have that will help you to be successful in your program for next year?
16. Which ability do you lack that you feel would help you to be successful in your high school program?
17. Which abilities do you have that will help you in the work you are planning?
18. Which ability do you lack that you feel would help you to be successful as a ___(first choice)___?
19. What particular interests and activities would your occupation satisfy?

Table 2.13 (continued)

20. As you know, things that are important to us are called values. Tell me some of your values.

21. What values of yours would working as a (first choice) satisfy?

22. Suppose your parents didn't agree with your plans. What would you do?

Table 2.14: Intercorrelations, Means, and Standard Deviations for Four Eighth-grade (1958) Variables (N = 110)

	SES			Mean	S.D.
Sex (male=1; female=2)	.01	.03	-.18	1.5	.6
Socioeconomic Status (1=hi; 7=lo)		-.35	-.14	4.0	1.6
Otis Beta Form Intelligence			.31	107.9	9.5
Readiness for Career Planning				32.4	10.8

intervals, it has been possible to score four transitions for coping behaviors, using the categories as an exclusive and exhaustive taxonomy. Unfortunately, five unequally populated cells is about two or three too many for multivariate statistical analysis of data on 111 subjects. It was necessary to pool the coping behaviors of floundering and stagnation into one category, which might then be called "unsatisfactory adjustment transitions," and to pool the other three coping behaviors into what might be called "satisfactory transitions," particularly to permit multivariate analysis of variance (MANOVA) in the measurement space of the eight RVP variables. The present strategy is to report parallel studies of criteria in the two spaces of 1) the eight RVP scales, and 2) the four predictors of Table 2.14 in order to compare results.

When the 1958/61 transitions were judged, 70 subjects were rated as "unsatisfactory" and only 40 were rated as "satisfactory." These are fairly global clinical ratings that take into account both the occupational and educational aspirations in both years and the actual educational or occupational placements. That there is some lawfulness apparent in the ratings over four transitions is evidenced by previously reported fitting of Markov chain theory to the data.

Looking at the separation of the two groups of 1958/61 ratings in the space of the eight 1958 RVP scales, as shown in Table 2.15, it appears that the RVP syndrome does not significantly separate the groups. Only Evidence for Self Ratings displays a marked contrast between the groups, and that in a contra-theory direction. Turning to Table 2.16, it can be seen that there is also a failure of separation of the criterion groups in the space of the four predictors. The "satisfactory" group has better RCP, intelligence, and socioeconomic status (and more females), but the trend is not significant.

In the light of this failure of short-range predictive validity for the two predictor sets, it is not surprising that the transitional coping behavior groups for the most remote transition, 1965/67, are not significantly separated in either of the measurement spaces. Table 2.17 shows that of the eight RVP scales Evidence for Self Ratings provides the only significant contrast between the groups. The "satisfactory" group is about one half a standard deviation higher on this variable than is the "unsatisfactory" group. Evidence for Self Ratings is based on judgments of the quality of the evidence cited by the subject in defense of his appraisal of his own abilities. It should be noted that the interview protocol items that combine to form this scale in the RVP system are not items that enter into scoring RCP. Table 2.18 reveals that for the 1965/67 transition the "satisfactory" group again has better RCP, intelligence, and socioeconomic status, but again to insignificant extents. It is interesting that in the latest ratings a majority of 58 subjects have been judged "satisfactory" and a minority of 51 have been judged "unsatisfactory." Perhaps this shift in the populations of the two categories from the 1958/61 transition in early adolescence to the 1965/67 transition in early adulthood represents a real gain in the percentage of subjects who are making reasonable progress toward their goals, and not just a softening of the standards of judgment. We hope so.

The fact that the subjects responded to a number of inventories in the 1967 data collection provides an opportunity to view the predictability of the latest coping behavior ratings from the measurement base of 11 inventory scales in a concurrent validity study. The first inventory scale, Occupational Aspirations, is adapted from Haller and Miller's instrument of the same name. High scores indicate personal preferences for high status occupations. The Work Beliefs scale is also adapted from Haller and Miller's inventory of the same name. High scores indicate beliefs about such matters as mobility, scheduling, and promptness which are judged to be conducive to success in the world of work. The four interest scales, Business, Outdoors and Shop, Cultural, and Science, are adaptations of the Project TALENT interest inventory, and the remaining five scales, Conformity, Impulsion, Sociability, Leadership, and Introspection, are adaptations of the Project TALENT temperament survey. The nine scales based on Project TALENT items follow quite

Table 2.15: MANOVA Study: criterion is 1958/61 transitional coping behavior ratings; group 1 (N = 70) floundering or stagnation; group 2 (N = 40) trial, instrumentation, or establishment; predictors are 1958 eight RVP scores

RVP Variables	Grp 1 Means	Grp 2 Means	Grp 1 S.D.s	Grp 2 S.D.s	F^{1}_{108}
Factors in Curriculum Choice	15.4	15.6	6.5	5.9	.0
Factors in Occupational Choice	14.3	15.2	4.7	4.5	.9
Verbalized Strengths and Weaknesses	6.1	6.9	3.0	3.7	1.5
Accuracy of Self Appraisal	7.1	7.0	1.5	1.3	.3
Evidence for Self Ratings	1.6	1.2	1.2	1.2	4.2
Interests	4.2	3.9	2.1	2.4	.8
Values	3.1	3.2	2.6	2.4	.0
Independence of Choice	4.4	4.3	1.9	1.8	.1

For equality of dispersions, MANOVA $F^{36}_{\infty} = 1.2$

For equality of centroids, MANOVA $F^{8}_{101} = 1.2$

Table 2.16: MANOVA Study; criterion is 1958/61 transitional coping behavior ratings; group 1 (N = 70) floundering or stagnation; group 2 (N = 40) trial, instrumentation, or establishment; predictors are 1958 sex, SES, IQ, RCP

Predictors from Eighth-grade (1958)	Grp 1 Means	Grp 2 Means	Grp 1 S.D.s	Grp 2 S.D.s	F^1_{108}
Sex (male = 1; female = 2)	1.5	1.6	.6	.5	1.7
Socioeconomic Status (1 = hi; 7 = lo)	4.0	3.9	1.6	1.7	.0
Otis Beta Form Intelligence	107.7	108.4	9.1	10.2	.1
Readiness for Career Planning	31.7	33.7	10.7	11.0	.9

For equality of dispersions, MANOVA $F^{10}_{\infty} = 1.0$

For equality of centroids, MANOVA $F^{4}_{105} = .8$

Table 2.17: MANOVA Study; criterion is 1965/67 transitional coping behavior ratings; group I (N = 51) floundering or stagnation; group 2 (N = 58) trial, instrumentation, or establishment; predictors are 1958 eight RVP scores

RVP Variables	Grp 1 Means	Grp 2 Means	Grp 1 S.D.s	Grp 2 S.D.s	F^{1}_{107}
Factors in Curriculum Choice	14.8	15.8	6.3	6.2	.8
Factors in Occupational Choice	14.4	14.6	4.7	4.8	.0
Verbalized Strengths and Weaknesses	6.2	6.6	3.5	3.1	.4
Accuracy of Self Appraisal	6.9	7.1	1.4	1.4	.8
Evidence for Self Ratings	1.1	1.7	1.2	1.2	7.4
Interests	4.0	4.1	2.5	1.9	.0
Values	3.0	3.2	2.5	2.7	.3
Independence of Choice	4.2	4.5	1.9	1.8	.8

For equality of dispersions, MANOVA F^{36}_{∞} = .8

For equality of centroids, MANOVA F^{8}_{100} = 1.0

Table 2.18: MANOVA Study; criterion is 1965/67 transitional coping behavior ratings; group I (N = 51) floundering or stagnation; group 2 (N = 58) trial, instrumentation, or establishment; predictors are 1958 sex, SES, IQ, RCP

Predictors from Eighth-grade (1958)	Grp 1 Means	Grp 2 Means	Grp 1 S.D.s	Grp 2 S.D.s	F^{1}_{107}
Sex (male = 1; female = 2)	1.5	1.5	.6	.5	.0
Socioeconomic Status (1 = hi; 7 = lo)	4.2	3.8	1.6	1.7	1.8
Otis Beta Form Intelligence	107.1	108.5	9.1	9.9	.6
Readiness for Career Planning	31.3	33.2	10.8	10.7	.9

For equality of dispersions, MANOVA $F^{10}_{\infty} = .5$

For equality of centroids, MANOVA $F^{4}_{104} = .6$

closely the outcomes of Lohnes' (1966) factor analysis of the motives domain in the Project TALENT battery. However, all these item pools were created for and tested on high school age youth, and there use with young adults four years out of high school is experimental, to say the least.

Table 2.19 contains the concurrent validity study results. Only one of the inventory scales separates the groups by an amount approaching one half of a standard deviation, and that is Conformity, on which the group rated "unsatisfactory" scores higher. In the Lohnes theory the Conformity variable represents an unintelligent global response set much like Edwards' social desirability factor, making this a convincing contrast between these two groups of young adults. Table 2.19 also shows the "unsatisfactory" group to be at a disadvantage with respect to Occupational Aspirations, Business Interest, Cultural Interest, and Science Interest. It is not surprising that they should be higher on Outdoors and Shop Interests or on Sociability, but their slight edge on Work Beliefs and larger edge on Introspection are contra-theory. In general, the concurrent validity of this 11-scale inventory battery appears to be real but weak.

Table 2.19: MANOVA Study; criterion is 1965/67 transitional coping behavior ratings; group 1 (N = 48) floundering or stagnation; group 2 (N = 58) trial, instrumentation, or establishment; predictors are 11 1967 inventory correlates

1967 Self-report Inventory Scales	Grp 1 Means	Grp 2 Means	Grp 1 S.D.s	Grp 2 S.D.s	F^{1}_{104}
Occupational Aspirations	40.8	42.0	9.3	11.2	.4
Work Beliefs	32.5	32.1	3.8	3.6	.3
Business Interest	81.2	89.5	30.7	33.1	1.8
Outdoors - Shop Interest	83.0	79.4	41.9	38.4	.2
Cultural Interest	88.4	92.2	27.7	25.2	.5
Science Interest	43.3	45.5	20.3	21.5	.3
Conformity	46.5	41.7	10.5	12.2	4.6
Impulsion	2.8	2.7	1.9	1.9	.0
Sociability	8.2	7.5	2.7	2.8	1.8
Leadership	1.6	1.5	1.4	1.6	.1
Introspection	8.0	7.0	2.7	2.9	2.9

For equality of dispersions, MANOVA $F^{66}_{\infty} = 1.1$

For equality of centroids, MANOVA $F^{11}_{94} = 1.2$

The 11 inventory scales are part of a set of 22 variables we have scaled from the 1967 protocols. The other variables include a masculinity-femininity scale based on the Project TALENT interest items, four scales based on the positions of the 1967 occupational aspiration and the 1967 occupational placement in the Anne Roe occupational group and occupational level structures, and six additional clinical-type ratings of aspects of the protocols. These "22 correlates" can be thought of as a set of criterion scales to which to relate the 1958 predictor sets by correlation procedures. Tables 2.20, 2.21, and 2.22 provide details on a rank 7 canonical correlation model relating the 1958 eight RVP scales to these 22 correlates from 1967. Once again, there is no strong, robust finding. Even this high-rank model accounts for little of the variance in the 22

Table 2.20: Canonical correlation of 1958 eight RVP scales with 1967 twenty-two correlates (N = 105); rank 7 model

Factor Set	Canonical R	1958 Eight RVP Percent Variance	1958 Eight RVP Percent Redundancy	1967 Twenty-two Percent Variance	1967 Twenty-two Percent Redundancy
1	.67	15.3	6.9	8.6	3.9
2	.53	14.1	4.0	4.4	1.2
3	.51	13.0	3.4	5.7	1.5
4	.46	11.8	2.4	7.1	1.5
5	.44	9.9	2.0	2.9	.6
6	.38	17.0	2.4	4.9	.7
7	.37	9.6	1.3	4.8	.7

Totals for rank 7 model:

Variance extracted from 1958 8-RVP = 90.7%
Redundancy of 1958 8-RVP = 22.4%
Variance extracted from 1967 22-scales = 38.4%
Redundancy of 1967 22-scales = 10.1%

Table 2.21: Canonical correlation factors of 1958 eight RVP scales (entries are factor-scale correlations, with coefficients smaller than .25 edited out for clarity)

	Canonical Factors						
RVP Variables	1	2	3	4	5	6	7
Factors in Curriculum Choice	.67		.57			.29	-.33
Factors in Occupational Choice			.41		.59		
Verbalized Strengths and Weaknesses	.55				.53		.44
Accuracy of Self Appraisal		.70	.34			-.42	-.27
Evidence for Self Ratings	.44	.52		-.67			
Interests	.37	.42		.60		.27	
Values	.27		.59		-.29	.33	.57
Independence of Choice		.29				.87	

Table 2.22: Canonical correlation factors of 1967 twenty-two correlates (entries are factor-scale correlations, with coefficients smaller than .25 edited out for clarity)

	Canonical Factors						
Twenty-two Scales	1	2	3	4	5	6	7
Occupational Aspirations	.52						
Work Beliefs			.25	.36			.47
Business Interest		.27	-.26	.63	.29		
Outdoors - Shop Interest		.40		.45			
Cultural Interest			.39				.42
Science Interest				.41		-.26	
Masculinity-Femininity	-.26	.43		.39			
Conformity	-.37		-.43		.25		.26
Impulsion					-.25		
Sociability							.26
Leadership				.37		.50	
Introspection					.35	.29	
Actual Roe Group	.44		.29				
Roe Group Aspirations	.35						
Actual Roe Level	-.38	.33	-.30				
Roe Level Aspirations	-.46						
Realism	.32						
Commitment	.59						
Parental Relations						.62	
Plans Certainty			.35	-.40		.29	
Adjustment		-.29	.45		.36		
DCP Rating			-.30				.29

correlates (38%) and displays little ostensible redundancy of the 1958 battery, given the total variance of the 1967 battery (22%), and even less redundancy of the 1967 battery, given the total variance of the 1958 battery (10%). Neither of the canonical factor patterns displays any approach to simple structure.

The canonical correlation relations of the 1967 twenty-two correlates with the four 1958 predictors are presented in Tables 2.23 and 2.24. These relations are stronger than those with the eight 1958 RVP scales, but this is because there is a definite sex effect for a number of the twenty-two correlates and sex is one of the four predictors. The first canonical factor for each sex displays this sex linkage. The magnitudes of the second and third canonical correlation coefficients in this study (.64 and .52) are very close to those of the first and second in the preceding study (.67 and .53). For both the second and third canonical relations, socioeconomic status loads higher on the prediction function than either intelligence or RCP.

Table 2.23: Canonical correlation of 1958 four predictors with 1967 twenty-two correlates (N = 105); rank 3 model, with canonical factors of 1958 data

		1958 Four X		1967 Twenty-two X	
Factor Set	Canonical R	Percent Variance	Percent Redundancy	Percent Variance	Percent Redundancy
1	.84	28.0	20.0	9.6	6.8
2	.64	33.7	13.6	14.4	5.8
3	.52	19.7	5.3	2.7	.1

Totals for rank 3 model

Variance extracted from 1958 predictors = 81.4%
Redundancy of 1958 predictors = 38.9%
Variance extracted from 1967 22-scales = 26.7%
Redundancy of 1967 22-scales = 12.7%

	Canonical Factors		
1958 Variables	1	2	3
Sex	.97	-.33	-.11
Socioeconomic Status	.22	.70	.62
Otis Intelligence	-.07	-.32	-.56
Readiness for Career Planning	.08	.56	-.54

Table 2.24: Canonical correlation factors of 1967 twenty-two correlates (entries are factor-scale correlations, with coefficients less than .25 edited out for clarity)

Twenty-two Scales	Canonical Factors 1	2	3
Occupational Aspirations	.36	-.47	
Work Beliefs			
Business Interest	.38	.33	
Outdoors - Shop Interest	.27	.51	
Cultural Interest			
Science Interest	.38		
Masculinity - Femininity		.42	
Conformity			.31
Impulsion			.26
Sociability			
Leadership	.43		
Introspection	.35		
Actual Roe Group	.42	-.38	
Roe Group Aspiration	.64		
Actual Roe Level	-.34	.62	
Roe Level Aspiration	-.66	.29	
Realism		-.65	.25
Commitment		-.69	
Parental Relationship		-.42	
Plans Certainty		-.42	-.39
Adjustment		-.28	
DCP Rating		.41	

The transitional coping behaviors data had one strike against them to start with, due to their basic subjectivity as evaluations placed on protocols of subjects by the researcher. The results just reported add the second strike of weak predictability from the antecedent variables of interest in this inquiry. Nevertheless, we will keep these data in the game for the two reasons that they represent the best approximation to scaling Super's very convincing construct of coping behaviors we can muster, and that they do succeed in displaying an innate orderliness in our Markov chain analyses of them. It may be that we will yet discover more meaningful relations of these data with other variables in the life histories of our subjects as we know them. Meanwhile we have to look for other career adjustment scales against which to try to demonstrate more convincingly the predictive potency of our vocational maturity measures.

2.6 The Career Development Tree

The CDS has in the past relied heavily on Anne Roe's constructs of occupational levels and occupational groups as criterion scales, placing the occupational aspirations of the subjects at the different developmental stages in these two taxonomic variables. The eighth grade RVP syndrome has been shown to be a valid predictor of Roe level of occupational aspiration at every one of the four developmental stages previously reported on, and of Roe group of occupational aspiration at the most remote stage previously reported one. That is, eighth-grade RVP yielded significant prediction of Roe group of aspiration two years out of high school. Successful Markov chain fittings have also been previously reported for these two Roe criterion variables. One of the problems with the Roe variables is that they are anything but independent, and are in theory the two axes of a lattic system containing 48 cells. No research program to date has been able to employ the lattice system successfully as a criterion variable. It has too many cells to serve as a factorial analysis of variance design, especially since the correlation of the factors of the design leads inevitably to practically empty cells in some regions. It can not be worked as a two-element vector variable because the scale positions on the group axis are strictly nominal. The problems with the Roe lattice are compounded when one tries to use it repeatedly in longitudinal studies such as the CPS or the CDS where a rather small sample of subjects is observed many times, because the resulting three-dimensional lattice really has a plethora of cells. Roe's group and level constructs are essential aspects of the theory of career development, but some refinements of scaling beyond the Roe lattice appear to be research necessities.

Recently, Cooley and Lohnes (1968) have capitalized on the extensive longitudinal data files of Project TALENT to refine a sequential structure of occupational taxonomy variables, inspired jointly by Roe's constructs and the construct of developmental stages as proposed by Ginzberg et al. (1951) and improved by Super et al. (1957). One of the major virtues of the Career Tree Structure arranged by Cooley and Lohnes is that its categories for occupational aspirations at each age level have been selected to be highly discriminable in suitable personality measurement spaces, as indicated by extensive computing on the Project TALENT data. Another attractive feature of the model is that the level of complexity of the taxonomic variable increases over time as a function of increasing vocational maturity, yet each new level of complexity is achieved by application of a simple dichotomous choice rule. Figure 2.1 reproduced from Cooley and Lohnes (1968, p. 4-57), represents the tree structure model.

The earliest dichotomization or branching in the tree is premised on Anne Roe's people-thing continuum (Roe and Siegelman, 1964). In Figure 2.1 the numbers in boldface under each branch node report the part of a nominal 1000 males that the Project TALENT estimates, based on tens of thousands of males in a national probability sample, place at that node. Thus it is estimated that of 1000 boys entering junior high school about 560 would be classed as primarily "thing" oriented and about 440 as primarily "people" oriented. The next dichotomization is based on whether or not the subject is planning to attend a four-year college, and so on. Eventually the twelve branch tips of the tree provide a twelve-category taxonomy of occupations or occupational aspirations for young adults, which is as complex as the view of the world of work promoted by this model ever gets. Even so, it is apparent that studies with the modest sample sizes of the CPS and CDS will not be able to use all of the detail of the twelve-category variable for many purposes. Figure 2.2 distributes the 111 subjects of the CDS through the branchings of the tree structure model. Note that substantially less than half of the subjects persist in aspiring to graduate from college, and the two highest level of aspiration cells at the branch tips are empty of subjects in this sample. The one subject who would clearly have persevered to cell three, Ph.D. in physical science or engineering, was a young man who was killed in an automobile accident.

A companion paper to this one discusses the transitions of the CDS subjects in the tree model at greater length. The purpose here is to report predictive validity studies for the eighth grade measurement sets which employ criterion variables based on the tree. Table 2.25 reports a study of the 1958 career tree variable, which is the people-thing dichotomy, in the measurement space of the 1958 eight RVP scores. The RVP scales do not provide a basis for predicting the concurrent tree variable. Table 2.26 reports the parallel study in the space of the four 1958 predictors. Here there is dramatic separation of the two criterion groups, but neither intelligence nor RCP contributes to the contrast. Sex is the big separator, with a preponderance of boys displaying a science and technology orientation and a majority of girls showing a humanistic, socio-

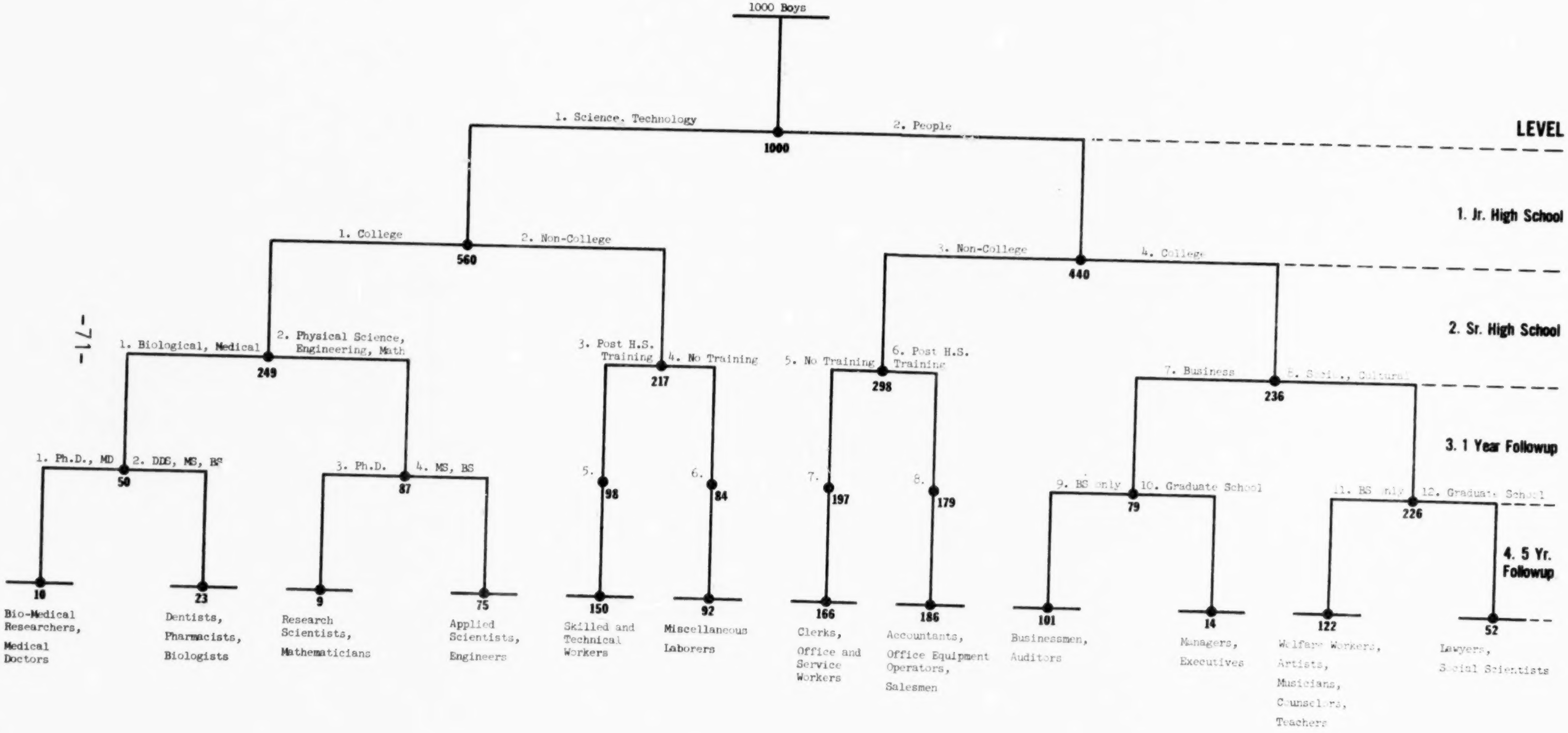

Figure 2.1: Project TALENT Career Development Tree (Cooley and Lohnes, 1968)

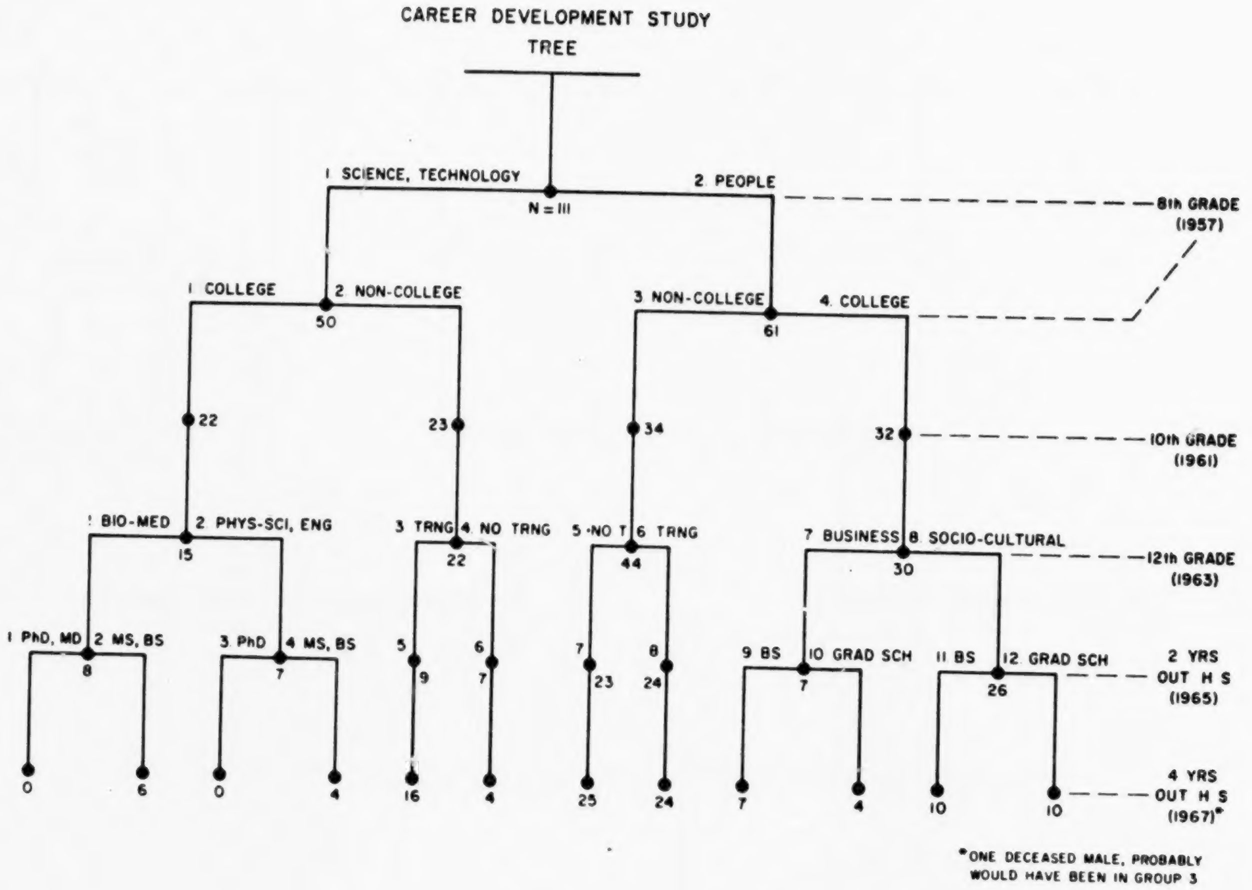

Figure 2.2: Career Development Study Tree

Table 2.25: MANOVA Study; criterion is 1958 career tree variable; predictors are 1958 eight RVP scores (N = 110)

	Orientation Groups		Pooled-	
1958 RVP Variables	Sci-tech (N = 49) Means	People (N = 61) Means	groups est. S.D.s	F^{1}_{108}
Factors in Curriculum Choice	16.5	14.7	6.2	2.3
Factors in Occupational Choice	14.2	14.9	4.6	.6
Verbalized Strengths and Weaknesses	6.3	6.6	3.3	.2
Accuracy of Self Appraisal	7.0	7.1	1.4	.1
Evidence for Self Ratings	1.5	1.4	1.2	.3
Interests	4.2	4.1	2.2	.1
Values	3.0	3.2	2.6	.1
Independence of Choice	4.5	4.3	1.9	.2

For equality of dispersions, MANOVA $F^{36}_{\infty} = 1.3$

For equality of centroids, MANOVA $F^{8}_{\infty} = .9$

Table 2.26: MANOVA Study; criterion is 1958 career tree variable; predictors are 1958 sex, SES, IQ, and RCP (N = 110)

	Orientation Groups			
Predictors from Eighth-grade (1958)	Sci-tech (N = 49) Means	People (N = 61) Means	Pooled-groups est. S.D.s	F^{1}_{108}
Sex (male = 1; female = 2)	1.2	1.7	.5	29.4
Socioeconomic Status (1 = high; 7 = low)	3.6	4.3	1.6	5.0
Otis Beta Form Intelligence	107.8	108.0	9.6	.0
Readiness for Career Planning	33.4	31.7	10.8	.6

For equality of dispersions, MANOVA F^{10}_{∞} = 1.1

For equality of centroids, MANOVA F^{4}_{105} = 9.4

cultural orientation. There is also a significant socioeconomic status contrast, with the science and technology oriented youths enjoying higher status as a group than do the humanistic, sociocultural oriented youths. It is theoretically satisfactory that the vocational maturity measures should not have concurrent validity for this basic interests orientation in early adolescence, because if they did have it would simply indicate an interests contamination in the maturity measures, which would be no more acceptable than a substantial intelligence contamination would be.

The 1961 tenth grade tree criterion has four cells, reflecting both basic interests and whether or not the subject plans to attend college. As shown in Table 2.27, the eight RVP scales do provide a basis for significant prediction of this variable. Factors in Curriculum Choice is the strongest predictor, with the effects indicating that the two college planning groups have given more careful thought to curriculum selection than the two non-college groups. Table 2.28 shows that the contrasts among the criterion groups are very strong in the space of the four predictors. Sex continues to be the strongest predictor, but there is a good, strong relationship between RCP and the criterion. The comparison of the modest predictive validity of intelligence with the strong validity of RCP is noteworthy.

Table 2.27: MANOVA Study; criterion is 1961 career tree variable; predictors are 1958 eight RVP scores (N = 110)

	Orientation Groups					
RVP	College Science (N = 22) Means	Non-coll Technol. (N = 22) Means	Non-coll Business (N = 34) Means	College Bus-cult (N = 32) Means	Pooled-groups est. S.D.s	F^{3}_{106}
I	16.7	15.4	12.6	17.8	6.0	4.5
II	13.9	13.9	14.2	16.1	4.6	1.6
III	7.2	6.1	5.2	7.4	3.2	3.1
IV	7.4	6.6	7.1	7.1	1.4	1.2
V	1.9	1.3	1.2	1.6	1.2	1.8
VI	5.1	3.3	3.6	4.5	2.1	3.6
VII	3.0	3.1	2.3	4.0	2.5	2.6
VIII	4.3	4.3	3.9	4.9	1.8	1.4

For equality of dispersions, MANOVA $F^{108}_{\infty} = 1.2$

For equality of centroids, MANOVA $F^{24}_{287} = 1.6$

Table 2.28: MANOVA Study; criterion is 1961 career tree variable; predictors are 1958 sex, SES, IQ, and RCP (N = 110)

	Orientation Groups					
Four Scales	College Science (N = 22) Means	Non-coll Technol. (N = 22) Means	Non-coll Business (N = 34) Means	College Bus-cult (N = 32) Means	Pooled-groups est. S.D.s	F^{3}_{106}
Sex	1.2	1.3	1.9	1.5	.5	8.7
SES	3.5	4.1	4.6	3.4	1.6	3.9
IQ	110.0	104.6	106.6	110.3	9.4	2.2
RCP	33.9	31.6	27.0	37.8	10.1	6.5

For equality of dispersions, MANOVA $F^{30}_{\infty} = 1.8$

For equality of centroids, MANOVA $F^{12}_{272} = 4.6$

The next six tables report predictive validity studies for the 1963, 1965, and 1967 career tree variables. Several trends are apparent. The predictive validity of the 1958 eight RVP scales increases steadily over time! This can be seen by comparing the centroids MANOVA F-ratios for 1961 = 1.6 (Table 2.27), 1963 = 1.7 (Table 2.29), 1965 = 2.0 (Table 2.31), and 1967 = 2.3 (Table 2.33). There is an irregular trend for the predictive validity of the 1958 four predictors to increase over time. The centroids F-ratios are 1961 = 4.6 (Table 2.28), 1963 = 4.4 (Table 2.31), 1965 = 6.6 (Table 2.32), and 1967 = 6.3 (Table 2.34). All four predictors are potent at every follow-up year, but sex and RCP are the stronger predictors in 1961 and 1963, whereas socioeconomic status moves to first place in 1965, and both SES and intelligence are stronger than sex and RCP in 1967. We are, of course, especially pleased with the robust univariate F-ratios for RCP for all four followup years. These are:

Career Tree Year	RCP F-ratio
1961	6.5
1963	6.1
1965	7.6
1967	4.6

Table 2.29: MANOVA Study; criterion is 1963 career tree variable; predictors are 1958 eight RVP scores (N = 110)

	Orientation Groups					
RVP	College Science (N = 15) Means	Non-coll Technol. (N = 21) Means	Non-coll Business (N = 44) Means	College Bus-cult (N = 30) Means	Pooled-groups est. S.D.s	F^{3}_{106}
I	17.2	14.8	13.3	17.9	6.0	4.0
II	13.9	13.6	13.9	16.4	4.7	2.4
III	6.9	6.1	5.3	8.0	3.1	4.7
IV	7.3	6.6	7.1	7.1	1.4	.8
V	2.2	1.1	1.2	1.8	1.2	4.9
VI	4.1	3.5	3.8	5.1	2.2	3.0
VII	2.7	2.7	2.6	4.3	2.5	3.3
VIII	4.2	4.0	4.3	4.8	1.9	.9

For equality of dispersions, MANOVA F^{108}_{∞} = .9

For equality of centroids, MANOVA F^{24}_{287} = 1.7

Table 2.30: MANOVA Study; criterion is 1963 career tree variable; predictors are 1958 sex, SES, IQ, and RCP (N = 110)

	Orientation Groups					
Four Scales	College Science (N = 15) Means	Non-coll Technol. (N = 21) Means	Non-coll Business (N = 44) Means	College Bus-cult (N = 30) Means	Pooled-groups est. S.D.s	F^{3}_{106}
Sex	1.1	1.4	1.8	1.4	.5	6.4
SES	3.5	4.1	4.5	3.3	1.6	3.8
IQ	112.5	103.5	106.3	111.0	9.1	4.6
RCP	33.5	29.9	29.0	38.7	10.1	6.1

For equality of dispersions, MANOVA $F^{30}_{\infty} = 1.5$

For equality of centroids, MANOVA $F^{12}_{272} = 4.4$

Table 2.31: MANOVA Study; criterion is 1965 career tree variable; predictors are 1958 eight RVP scores (N = 110)

	Orientation Groups					
RVP	College Science (N = 15) Means	Non-coll Technol. (N = 15) Means	Non-coll Business (N = 47) Means	College Bus-cult (N = 33) Means	Pooled-groups est. S.D.s	F^{3}_{106}
I	19.0	12.1	13.5	17.9	5.7	7.6
II	14.6	12.4	14.2	15.9	4.7	2.0
III	7.3	5.6	5.7	7.5	3.2	2.8
IV	7.9	6.2	7.0	7.0	1.4	4.1
V	1.9	1.2	1.2	1.8	1.2	3.1
VI	4.4	4.0	3.5	4.8	2.2	2.4
VII	3.8	1.7	2.7	4.0	2.5	4.1
VIII	4.7	4.1	4.4	4.3	1.9	.3

For equality of dispersions, MANOVA F^{108}_{∞} = 1.3

For equality of centroids, MANOVA F^{24}_{287} = = 2.0

Table 2.32: MANOVA Study; criterion is 1965 career tree variable; predictors are 1958 sex, SES, IQ, and RCP (N = 110)

	Orientation Groups					
Four Scales	College Science (N = 15) Means	Non-coll Technol. (N = 15) Means	Non-coll Business (N = 47) Means	College Bus-cult (N = 33) Means	Pooled-groups est. S.D.s	F^{3}_{106}
Sex	1.3	1.1	1.8	1.4	.5	8.3
SES	3.3	4.5	4.7	3.0	1.5	10.5
IQ	111.6	103.1	105.8	111.5	9.0	4.9
RCP	37.0	26.7	29.1	37.7	9.9	7.6

For equality of dispersions, MANOVA F^{30}_{∞} = .8

For equality of centroids, MANOVA F^{12}_{272} = 6.6

Table 2.33: MANOVA Study; criterion is 1967 career tree variable; predictors are 1958 eight RVP scores (N = 109)

	Orientation Groups					
RVP	College Science (N = 10) Means	Non-coll Technol. (N = 19) Means	Non-coll Business +N = 49) Means	College Bus-cult (N = 31) Means	Pooled-groups est. S.D.s	F^{3}_{105}
I	17.4	13.2	13.7	18.5	5.9	5.5
II	12.7	12.9	14.3	16.3	4.6	2.8
III	5.8	6.0	5.7	7.9	3.2	3.4
IV	8.0	6.5	7.0	7.0	1.4	2.5
V	2.0	1.1	1.1	2.0	1.2	5.4
VI	3.1	3.6	3.9	5.0	2.1	3.1
VII	3.0	2.7	2.6	4.2	2.5	3.1
VIII	4.5	4.8	4.3	4.1	1.9	.7

For equality of dispersions, MANOVA $F^{108}_{\infty} = 1.2$

For equality of centroids, MANOVA $F^{24}_{284} = 2.3$

Table 2.34: MANOVA Study; criterion is 1967 career tree variable; predictors are 1958 sex, SES, IQ, and RCP (N = 109)

	Orientation Groups					
Four Scales	College Science (N = 10) Means	Non-coll Technol. (N = 19) Means	Non-coll Business (N = 49) Means	College Bus-cult (N = 31) Means	Pooled-groups est. S.D.s	F^{3}_{105}
Sex	1.3	1.3	1.8	1.4	.5	6.6
SES	3.7	4.4	4.6	2.8	1.5	9.8
IQ	113.1	101.1	106.3	112.8	8.6	9.2
RCP	32.8	30.2	29.4	37.9	10.2	4.6

For equality of dispersions, MANOVA $F^{30}_{\infty} = 1.2$

For equality of centroids, MANOVA $F^{12}_{270} = 6.3$

In the career tree data for nine years, almost one-half of the subjects display patterns of transitions in their aspirations that can be classified as "path-following." Each of the path-followers traces one of the twelve branches provided in the career tree. The majority of the subjects can be classified as "path-jumping," since at least once they make a transition in aspiration that removes them from one of the twelve branches and transports them to some other branch. (To more nearly balance the populations in the two groups, the authors have classified as path-followers eight subjects who followed non-college branches strictly over the four transitions observed but who, in the most recent 1965/67 transition jumped from either no post high school training to some post high school training or the other way. This is viewed as a modestly meaningful jump in comparison to the other available jumps.) For people who are path-followers, expressed aspiration at any time is of course the best prediction of what the aspiration will be at a later time. For path-jumpers, Cooley and Lohnes argue that a probability law governing their migrations can be phrased:

> Our research and that of others shows that migration from one stable career path to another (or path-jumping) tends to take the individual to a path for which he is closer to the centroid. That is, changing plans so that his career pattern is classified as unstable usually decreases the generalized distance of the individual from his group's centroid in a suitable personality measurement space. This change law is perhaps the most significant finding of psychometric research on career variables. (Cooley and Lohnes, 1968, p. 5-4)

An interesting issue is the possible predictability of who will be a path-jumper and who will be a path-follower. Sex is a predictor, since more females are path-followers than are males. Table 2.35 indicates that eighth grade RVP measures are a basis for predicting this dichotomy, with jumpers scoring higher than followers on the two best predictors, which are Factors in Curriculum Choice and Accuracy of Self Appraisal. Table 2.36 displays the sex contrast and indicates that RCP is a significant predictor of this criterion behavior, with the path-jumpers scoring higher on this vocational maturity scale than do the path-followers. There would seem to be an important implication for career development theory in this finding that people whose occupational aspirations over the span from early adolescence to early adulthood follow a simple tree structure model tend to be rated as less vocationally mature in early adolescence than those whose patterns violate the simple structural model. The data of Table 2.37 reinforce this implication by showing that on inventory scales in early adulthood (1967) the path-jumpers have higher occupational aspiration, stronger cultural interests, more introspection, and less conformity than the path-followers. Note in Table 2.36 that the jumpers are not more intelligent and enjoy only a slight advantage in socioeconomic status of family, yet the suggestion is that in some ways the jumpers who break the rules of the tree structure are stronger people.

Table 2.35: MANOVA Study; criterion is 1958-67 career tree structure behaviors; predictors are 1958 eight RVP scores (N = 110)

1958 RVP Variables		Orientation Groups: Path-Followers (N = 51) Means	Orientation Groups: Path-Jumpers (N = 59) Means	Pooled-groups est. S.D.s	F^{1}_{108}
I	Factors in Curriculum Choice	13.9	16.6	6.1	5.1
II	Factors in Occupational Choice	15.0	14.1	4.7	1.1
III	Verbalized Strengths and Weaknesses	6.7	6.2	3.3	.6
IV	Accuracy of Self Appraisal	6.8	7.2	1.4	2.0
V	Evidence for Self Self Ratings	1.6	1.4	1.2	.7
VI	Interests	4.3	3.9	2.2	.9
VII	Values	3.0	3.2	2.6	.1
VIII	Independence of Choice	4.2	4.5	1.9	.9

For equality of dispersions, MANOVA F^{36}_{∞} = 1.0

For equality of centroids, MANOVA$^{8}_{101}$ = 2.3

Table 2.36: MANOVA study; criterion is 1958-67 career tree structure behaviors; predictors are 1958 sex, SES, IQ, and RCP (N - 110)

	Orientation Groups			
Predictors from Eighth-grade (1958)	Path-Followers (N = 51) Means	Path-Jumpers (N = 59) Means	Pooled-groups est. S.D.s	F^{1}_{108}
Sex (male = 1; female = 2)	1.6	1.4	.6	4.5
Socioeconomic Status (1 = high; 7 = low)	4.2	3.8	1.6	1.5
Otis Beta Form Intelligence	108.3	107.6	9.6	.1
Readiness for Career Planning	30.7	34.0	10.7	2.6

For equality of dispersions, MANOVA F^{10}_{∞} = 1.9

For equality of centroids, MANOVA F^{4}_{105} = 2.1

Table 2.37: MANOVA Study; criterion is 1958-67 career tree structure behaviors; predictors are eleven 1967 inventory scales (N = 106)

1967 Self-report Inventory Scales	Orientation Groups Path-Followers (N = 48) Means	 Path-Jumpers (N = 58) Means	Pooled-groups est. S.D.s	F^1_{104}
Occupational Aspirations	38.4	44.0	10.0	8.5
Work Beliefs	32.4	32.3	3.7	.0
Business Interests	82.3	88.6	32.1	1.0
Outdoors - Shop Interests	78.6	83.1	40.0	.3
Science Interests	90.2	90.7	26.4	.0
Cultural Interests	39.0	49.9	20.3	6.5
Impulsion	2.6	2.9	1.9	1.0
Sociability	7.6	8.1	2.8	.8
Leadership	1.4	1.6	1.5	.2
Introspection	6.8	8.0	2.8	5.4
Conformity	45.7	42.3	11.6	2.3

For equality of dispersions, MANOVA $F^{66}_{\infty} = 1.1$

For equality of centroids, MANOVA $F^{11}_{94} = 2.0$

2.7 Summary and Conclusions

Published predictive validities of vocational maturity scales collected in early adolescence can be characterized as weak but positive. To some extent the research problem has been to find more appropriate followup criteria for vocational maturity scales. This section has reported predictive validity studies for two sets of variables collected on 110 subjects when they were in the eighth grade. The first set is eight Readiness for Vocational Planning (RVP) scales. The second set is sex, socioeconomic status, Otis intelligence, and Readiness for Career Planning (RCP), which is a unitary vocational maturity scale from a subset of the RVP items. Both RVP and RCP are relatively free of correlation with sex, socioeconomic status, and intelligence.

A series of studies involving transitional coping behaviors as the criteria once again showed only disappointing degrees of predictive validity for RVP and RCP. Canonical relations of both sets of predictors with a set of twenty-two 1967 correlates were relatively weak, except for sex linkages.

The breakthrough occurred when a set of criteria were scaled from a career tree structure model for transitions in educational and occupational aspirations over time. RVP and RCP were both robustly related to the career tree variables at all points in time, with a regular trend for RVP validity to increase over time. Comparative validities of sex, socioeconomic status, and intelligence were reported.

Path-following versus path-jumping in the career tree is moderately predictable, and there are indications that the path-jumpers as a group are the stronger people.

Chapter 3

Probability Models for Career Patterns

3.1 The Markov Chain as Null Hypothesis

The trait model of measurement is easily employed to predict a criterion measure at time 2 from a predictor measure at time 1, even if both measures are multivariate. However, development surveys that employ a nominal adjustment criterion observed repeatedly over several or many time intervals pose a design problem that has not been adequately solved. What is the appropriate prediction model for relating antecedent trait measures to a posterior time series on a nominal variable? In such a case the criterion data follow a multivariate multinominal distribution, a form with which we have little experience. The initial attractiveness of the Markov chain stems from the simple fact that it provides an analysis of a time series on a nominal variable. The Markov chain is a powerful model for such data, in that it yields many insights and useful predictions for any development process that follows a probability law of the chain type. On the other hand, the power of the model is purchased at the price of a set of restrictive assumptions that few development processes are likely to satisfy. Our thesis is that the most interesting variability in a development process scaled as a time series on a nominal variable is the variability not accounted for by the best fitting Markov chain. The ability of a psychometric prediction system to improve on the predictions from the Markov chain may provide the most convincing demonstration of the predictive validity of the antecedent trait measures for the development criterion.

Lohnes (1965) reviewed the features of Markov chains that are useful for human development surveys, and Gribbons and Lohnes (1968) reported a series of Markov chain analyses of career development data in their book on the Career Development Study (CDS). Recently the availability of ten-year followup data from that longitudinal study has permitted the testing of predictions from the reported chains. Reflection on the implications of the successes and failures of those predictions led to the point of view to be exposited here by references to a new Markov chain analysis of CDS data.

The new Markov variable was inspired by the Project TALENT career tree structure (Cooley and Lohnes, 1968, Ch. IV). It is a four cell nominal variable that classifies occupational aspirations according to (1) whether they reflect primarily a thing orientation or a people orientation (following Roe and Siegelman, 1964), and (2) whether or not they involve a college baccalaureate degree. Table 3.1 identifies the four groups and shows the original eighth grade distribution of the 57 boys and 54 girls. The ten-year followup distribution is figurable as the column sums of bracketed frequencies in the second part of Table 3.2, i.e., Transition 4

Table 3.1: Observed Transitions in Career Goals as Proportions of Row Totals (Frequencies in Brackets)

1958 (Eighth Grade) Distribution

CS:	College Science	.30	(33)
NT:	Non-college Technology	.15	(17)
NB:	Non-college Business, Cultural	.22	(24)
CB:	College Business, Cultural	.33	(37)

Transition 1 (1958-1961)

	CS	NT	NB	CB
CS	.49 (16)	.30 (10)	.03 (1)	.18 (6)
NT	.12 (2)	.59 (10)	.12 (2)	.17 (3)
NB	.04 (1)	.04 (1)	.79 (19)	.13 (3)
CB	.08 (3)	.06 (2)	.32 (12)	.54 (20)

Transition 2 (1961-1963)

	CS	NT	NB	CB
CS	.54 (12)	.23 (5)	.05 (1)	.18 (4)
NT	.13 (3)	.65 (15)	.09 (2)	.13 (3)
NB	.00 (0)	.06 (2)	.94 (32)	.00 (0)
CB	.00 (0)	.00 (0)	.28 (9)	.72 (23)

Transition 3 (1963-1965)

	CS	NT	NB	CB
CS	.60 (9)	.00 (0)	.00 (0)	.40 (6)
NT	.23 (5)	.64 (14)	.04 (1)	.09 (2)
NB	.02 (1)	.02 (1)	.89 (39)	.07 (3)
CB	.00 (0)	.04 (1)	.23 (7)	.73 (22)

Table 3.2: Markov Chain Theory Matrix and Tests of Theory

Stationary Transition Matrix

	CS	NT	NB	CB
CS	.53	.21	.03	.23
NT	.16	.63	.08	.13
NB	.02	.04	.88	.06
CB	.03	.03	.28	.66

Stationarity Hypothesis $\chi_{24}^2 = 24.5$, $p \sim .50$

Order Zero Versus Order One $\chi_{36}^2 = 51.9$, $p \sim .01$

Order One Versus Order Two $\chi_{9}^2 = 357.$, $p < .001$

Transition 4 (1965-1967)

	CS	NT	NB	CB
CS	.72 (10)	.14 (2)	.00 (0)	.14 (2)
NT	.06 (1)	.69 (11)	.19 (3)	.06 (1)
NB	.00 (0)	.09 (4)	.91 (43)	.00 (0)
CB	.00 (0)	.09 (3)	.09 (3)	.82 (27)

Theory Matrix Versus New Transitions, $\chi_{12}^2 = 22.9$, $.02 < p < .05$

1958-1967 Transitions Versus Fourth Power of Theory Matrix (Expected Proportions from Fourth Power in Brackets)

	CS	NT	NB	CB
CS	.28 (.17)	.22 (.22)	.16 (.31)	.34 (.30)
NT	.05 (.16)	.47 (.26)	.18 (.32)	.30 (.26)
NB	.04 (.06)	.08 (.10)	.84 (.70)	.04 (.15)
CB	.00 (.06)	.08 (.09)	.57 (.57)	.35 (.28)

Fourth Power Hypothesis $\chi_{12}^2 = 15.5$, $.30 > p > .20$

(1965-1967). Thus, while 33 subjects aspired to College Science (CS) careers in eighth grade, only 11 subjects aspire to such careers 10 years later, and while only 24 subjects were interested in Non-college Business and Cultural careers in eighth grade, 49 subjects accept such careers as their lot as young adults. It would seem that many of the goals held in early adolescence turned out to be unrealistic. There is a lot of development in aspirations over the ten year period to be explained.

A Markov chain analysis begins with the tabulation of the actual transition frequencies for each observation interval and converting these to proportions of row totals. In each such table the rows represent the states of the variable at the earlier stage and the columns represent the states of the variable at the later stage. Thus in Table 3.1, (Transition 1 (1958-1961) the tows report the Markov variable for eighth grade and the columns for tenth grade. Each number in brackets is the frequency of transitions from that row state in 1958 to that column state in 1961. For example, 16 subjects who expressed CS aspirations in 1958 expressed CS aspirations again in 1961. These 16 persevering subjects were .49 of all those who expressed CS aspirations in 1958. The other half migrated in 1961 to the other three cells in the frequencies and proportions shown, with the biggest migrant group being the 10 subjects who retained their thing orientation but gave up their college plans. Notice that this first transition matrix is diagonal dominated, meaning that for every category the largest proportion of the 1958 entrants is those who retained that aspiration in 1961. Transition 2 (1961-1963) and Transition 3 (1963-1965) also show strong diagonal domination. Notice that over the years there is very little recruitment into the CS and NT groups from the NB and CB groups. Those who are people oriented in early adolescence retain that orientation for the most part into early adulthood.

Table 3.1 provides interesting data reduction but no theory. Markov chain theorizing assumes that there is a constant transition probabilities matrix for the population, from which each of the observed transition matrices deviates only due to sampling fluctuations. This assumption of constant probabilities for transitions that do not depend on the place in the time series of the transitions observed is a very strong assumption. Another assumption is that the process has one-step memory, in that the probabilities of the various outcomes for a subject at any transition are dependent only on his state of input to that transition, and not at all on his earlier history as reflected in the path by which he arrived at his input state. This is almost a ridiculous assumption to make about a human development process, but we point out that it is not nearly as ridiculous as the alternative hypothesis that the transitions represent a random walk, or a process with no memory whatever. We suggest that the Markov chain provides a better null hypothesis for such data than the random walk that is usually invoked.

The best fitting Markov chain for the data is induced by a maximum likelihood method described by Anderson and Goodman (1957). The fitted constant transition matrix (also called the stationary, or theory, matrix) for our data is reported at the top of Table 3.2. Notice that it appears to be a sort of an average of the three actual transition matrices. By inspection it is not a bad fit to the three data matrices. The chi square tests that come next in Table 3.2 assure us that (1) the stationarity notion makes good sense for this data; (2) the random walk notion can be safely rejected; and (3) we cannot reject the possibility that a chain with two-step memory would fit the data better than the fitted one-step memory chain does. At the moment we are not interested in pursuing the possibility of a two-step memory fit because of the small size of our data set.

Next, the new data from the most recent followup are used to test the Markov chain theory's predictive validity. Transition 4 (1965-67) should be compared entry by entry with the hypothesis provided by the stationary transition matrix. The new data break the theory, mainly because the diagonal domination of the latest transition matrix is much stronger than the theory allows. But, how sensible this is in career psychology terms. In young adulthood the subjects are tending to lock onto fixed aspirations much more than they did in adolescence. This greater stability has been shown elsewhere (Gribbons and Lohnes, 1968) to reflect greater realism, greater satisfaction, and one might say, the maturation of the development process. The rather stupid formal probability theory breaks down in a way which is supportive of psychological theory.

A hard test for the Markov chain is to predict the long-step transitions from first observations in eighth grade to latest observations ten years later. As shown by Kemeny and Snell (1960), the fourth power of the theory matrix renders such long-step predictions spanning four time intervals. At the bottom of Table 3.2 these predictions are placed in brackets alongside the actual long-step proportions. The Markov theory stands up to this test pretty well. It predicts that the NB group will be the only one in which a majority of 1958 starters will still be found in 1967. However, the actual long-step stabilities for all four groups are higher than predicted. Can career psychology explain this? Yes, if we note that the orientation dichotomy is sex linked and the colleging dichotomy is intelligence and social class linked, and these mediating variables are stubbornly enduring.

The acid test for a theory of human development is the goodness of long-step predictions for individuals. Given the 1958 entry states for the 111 subjects, the Markov chain theory correctly predicts the 1967 states for 45 per cent. These predictions are arrived at by assigning each subject to that group for which the entry is the largest in the row of the fourth power of the theory matrix corresponding to his entry group. We have taken our best psychometric shot at this prediction problem by predicting the 1967 states for the subjects from their 1958 eighth grade score profiles on four variables (sex, socioeconomic status, intelligence, and vocational maturity), and taking into account the known 1958 sizes of the criterion groups as prior probabilities. This psychometric prediction system achieves 54 per cent hits, which is a rather slight improvement over the 45 per cent hits from the formal probability model. Note that the random walk which would usually be used as a standard of comparison would be expected to yield only 25 per cent hits for this four cell criterion.

Finally, we propose to try to improve predictions by marrying the Markov basis to the psychometric basis. The psychometric: Markov prediction system employs the 1958 measurement profiles and the information contained in the fourth power of the Markov theory matrix, by using the row of the latter corresponding to each subject's 1958 entry state as the prior probabilities in his classification computation. For these data we achieve only a 56 per cent hit rate, but we are convinced there will be data collections for which this combined prediction system will provide really improved hit rates. Then we will have an indication that a theory for the development process will have to take into account both a degree of inherent lawfulness in the criterion variable and a degree of covariance with a multivariate trait predictor.

3.2 Fourth Transitions on Other Variables

In Emerging Careers we reported seemingly reasonable Markov chain fits for girls and boys separately on a dichotomous level of occupational aspiration variable, and for girls on a dichotomous educational aspiration variable. These fits were computed on the three transitions available at that time. Since then the availability of observations for a fourth transition (1965 to 1967) has made it possible to test the predictive validities of the chains, with results we now report.

Table 3.4 reviews the earlier results on girls' educational aspirations and adds the analyses of the new data. Note that in the 8th grade 41% of the girls planned to attend a baccalaureate college, but this percentage eroded steadily, until in 1967 the interviews showed only 20% aspiring to baccalaureate degrees. The theory matrix of stationary probabilities gives a girl who aspires to a college degree at any time two chances out of three of maintaining that aspiration over a two year transition period, while it gives a girl who starts a period with no college degree plans only slightly better than one chance out of ten of acquiring such plans over the next two years. The limiting matrix predicts that finally only 27% of the girls will achieve baccalaureate degrees.

The new data on the 1965-67 transition are reasonably close to the predictions of the theory matrix. The greatest discrepancy

Table 3.3: Three Prediction Systems Compared

I. Markov Chain Predictions, Given 1958 Entry State for Each Subject and Fourth Power of Theory Matrix

		Predicted 1967 Groups			
		CS	NT	NB	CB
Actual 1967 Groups	CS	0	0	11	0
	NT	0	0	20	0
	NB	0	0	49	0
	CB	0	0	30	0

45 per cent Hits

II. Psychometric Predictions, Given 1958 Sex, SES, IQ, RCP, and 1958 Prior Distribution for Career Goals Variable

		Predicted 1967 Groups			
		CS	NT	NB	CB
Actual 1967 Groups	CS	0	0	2	8
	NT	4	0	8	7
	NB	2	0	35	12
	CB	4	0	3	24

54 per cent Hits

III. Psychometric: Markov Predictions, Given 1958 Sex, SES, IQ, RCP, and Priors from Rows of Theory Fourth Power Corresponding to 1958 Entry States of Subjects

		Predicted 1967 Groups			
		CS	NT	NB	CB
Actual 1967 Groups	CS	2	4	2	2
	NT	1	10	5	3
	NB	1	3	39	6
	CB	9	6	5	10

56 per cent Hits

Table 3.4: Markov Chain Analysis of Educational Aspirations

Girls, N = 54

Markov	Educational Aspirations
Group 1	graduate school; four-year college
Group 2	junior college; nursing; vocational school; high school only; some high school

Initial Probabilities

Group 1: .41 Group 2: .59

Transition Matrix 1 (1958-1961)
(frequencies in brackets)

		Group 1	1961	Group 2
1958	Group 1	.59 (13)		.41 (9)
	Group 2	.16 (5)		.84 (27)

Transition Matrix 2 (1961-1963)

		Group 1	1963	Group 2
1961	Group 1	.67 (12)		.33 (6)
	Group 2	.08 (3)		.92 (33)

Transition Matrix 3 (1963-1965

		Group 1	1965	Group 2
1963	Group 1	.80 (12)		.20 (3)
	Group 2	.13 (5)		.87 (34)

Table 3.4 (continued)

Stationary Transition Matrix

	Group 1	Group 2
Group 1	.673	.327
Group 2	.121	.879

Stationarity hypothesis $\chi_4^2 = 2.6$, $p \sim .62$

Order zero versus order one $\chi_1^2 = 52.$, $p < .001$

Order one versus order two $\chi_2^2 = .70$, $p \sim .71$

Powers of Stationary Matrix for Girls' Educational Aspirations

Second Power (1958-1963 Transitions)

1958	Group 1	.493	.508
	Group 2	.188	.812

Third Power (1958-1965 Transitions)

1958	Group 1	.393	.607
	Group 2	.225	.775

Fourth Power (1958-1967 Transitions)

1958	Group 1	.338	.662
	Group 2	.245	.755

Limiting Matrix (Equilibrium at 13th Power)

Group 1	.270	.730
Group 2	.270	.730

Table 3.4 (continued)

Test of Fit of Stationary Matrix Against 1967 Observations

Transition Matrix 4 (1965-1967)

			1967		
		Group 1			Group 2
	Observed	.65 (11)		Observed	.35 (6)
Group 1	Expected	.673 (11.4)		Expected	.327 (5.6)
	χ^2 =	.01		χ^2 =	.03
1965					
	Observed	.00 (0)		Observed	1.00 (37)
Group 2	Expected	.121 (3.8)		Expected	.897 (33.2)
	χ^2 =	3.80		χ^2 =	.43

Goodness of fit hypothesis $\chi_2^2 = 4.27$, $.25 > p > .10$

Test of Fit of Fourth Power of Stationary Matrix Against 1958 to 1967 Transitions

			1967		
		Group 1			Group 2
	Observed	.455 (10)		Observed	.545 (12)
Group 1	Expected	.338 (7.4)		Expected	.662 (14.6)
	χ^2 =	.92		χ^2 =	.46
1958					
	Observed	.094 (3)		Observed	.906 (29)
Group 2	Expected	.245 (7.8)		Expected	.755 (24.2)
	χ^2 =	2.96		χ^2 =	.95

Goodness of fit hypothesis $\chi_2^2 = 5.29$, $p < .05$

is that in fact no young women who started this period without baccalaureate aspirations acquired such plans over the period. All the Group 2 members appear to be trapped there. The theory does not pass the hard test of predicting the long-step transition distribution from 1958 to 1967. The problem is that both groups are more stable over the long step than the theory predicts them to be. This means that the 1958 educational aspirations of the girls are better indicators of what their 1967 educational aspirations will be than the chain theory based on intervening transitions leads us to expect. The distressing reality is that fully 90% of the girls who abjured college plans in the 8th grade interviews still abjure college aspirations in 1967. This is really a self-imposed, self-fulfilling prophecy with a vengeance. Note that less than half of the girls who expected in the 8th grade to earn college degrees still have this aspiration in 1967.

The picture on boys' level of occupational aspiration patterns is more encouraging (Table 3.5). Slightly more than half the boys started in 1958 with high aspirations, the limiting matrix predicts that almost half the men will have high aspirations when the process achieves equilibrium, and in fact in the 1967 data 63% of the young men profess aspirations to Group 1, or high level, vocations. The noteworthy feature of the theory matrix and of the first three data matrices to which it was fitted is their high degree of diagonal domination, so that in fact and theory there are about three chances out of four of remaining over a period in whatever group one starts that period in.

We see that the data for the 1965-67 transition match the theory matrix in distribution reasonably well. The differences are quite encouraging, in that more young men who had high occupational aspirations in 1965 have retained them in 1967 than predicted, and more who had low aspirations in 1965 have changed to high aspirations in 1967 than predicted. The theory does reasonably well on the difficult task of predicting the distribution of long-step 1958-1967 transitions, also. The discrepancy is encouraging because it is mostly in a greater percentage of high-aspiring 8th grade males who display that high aspiration again four years beyond high school than is predicted by the fourth power of the theory matrix.

The women do not fare as well as the men on occupational aspiration level patterns (Table 3.6). Instead, their patterns on this variable are very much like their patterns on educational aspirations, with only 15% of the young women expressing Group 1 aspirations in 1967. The theory matrix does not predict the 1965-67 transitions reasonably well, because too few women maintained high aspirations and too many maintained low aspirations over this period. The long-step 1958-67 distribution is not reasonably well predicted, again mostly because too few of the girls who expressed high vocational aspirations in the 8th grade have again expressed high vocational aspirations when interviewed four years beyond high

Table 3.5: Markov Chain Analysis of Roe Level of Occupational Aspirations

Boys, N = 56

Markov	(Modified) Roe Level of Occupational Aspirations
Group 1	1, doctors, high managerial; 2, professionals, managerial
Group 2	3, semi-professionals, low managerial; 4, skilled workers; 5, semi-skilled; 6, unskilled; 7, no aspiration

Initial Probabilities

Group 1: .57 Group 2: .43

Transition Matrix 1 (1958-1961)

	Group 1	1961	Group 2
Group 1	.75 (24)		.25 (8)
1958			
Group 2	.29 (7)		.71 (17)

Transition Matrix 2 (1961-1963)

	Group 1	1963	Group 2
Group 1	.71 (22)		.29 (9)
1961			
Group 2	.16 (4)		.84 (21)

Transition Matrix 3 (1963-1965)

	Group 1	1965	Group 2
Group 1	.88 (23)		.12 (3)
1963			
Group 2	.20 (6)		.80 (24)

Table 3.5 (continued)

Stationary Transition Matrix

	Group 1	Group 2
Group 1	.775	.225
Group 2	.215	.785

Stationary hypothesis $\chi_4^2 = 4.0$, $p \sim .41$

Order zero versus order one $\chi_1^2 = 53.$, $p < .001$

Order one versus order two $\chi_2^2 = 4.9$, $p < .09$

Powers of Stationary Matrix for Boys' Roe Level of Occupational Aspirations

	Second Power (1958-1963 Transitions)		
1958	Group 1	.649	.351
	Group 2	.335	.665
	Third Power (1958-1965 Transitions)		
1958	Group 1	.578	.422
	Group 2	.403	.597
	Fourth Power (1958-1967 Transitions)		
1958	Group 1	.539	.461
	Group 2	.441	.559
	Limiting Matrix (Equilibrium at 14th Power)		
	Group 1	.489	.511
	Group 2	.489	.511

Table 3.5 (continued)

Test of Fit of Stationary Matrix Against 1967 Observations

Transition Matrix 4 (1965-1967)

			1967	
			Group 1	Group 2
1965	Group 1	Observed	.82 (24)	.18 (5)
		Expected	.775 (21.6)	.225 (6.4)
		χ^2	= .27	= .31
	Group 2	Observed	.37 (10)	.63 (17)
		Expected	.215 (6.0)	.785 (22.0)
		χ^2	= 2.67	= 1.14

Goodness of fit hypothesis $\chi_2^2 = 4.39$, $.25 > p > .10$

Test of Fit of Fourth Power of Stationary Matrix Against 1958 to 1967 Transitions

			1967	
			Group 1	Group 2
1958	Group 1	Observed	.719 (23)	.281 (9)
		Expected	.539 (17.3)	.461 (14.7)
		χ^2	= 1.88	= 2.21
	Group 2	Observed	.500 (12)	.500 (12)
		Expected	.441 (10.6)	.559 (13.4)
		χ^2	= .18	= .15

Goodness of fit hypothesis $\chi_2^2 = 4.42$, $.25 > p > .10$

Table 3.6: Markov Chain Analysis of Roe Level of Occupational Aspirations

Girls, N = 54

Markov	(Modified) Roe Level of Occupational Aspirations
Group 1	1, doctors, high managerial; 2, professionals, managerial
Group 2	3, semi-professionals, low managerial; 4, skilled workers; 5, semi-skilled; 6, unskilled; 7, no aspiration

Initial Probabilities

Group 1: .43 Group 2: .57

Transition Matrix 1 (1958-1961)

	Group 1	1961	Groups2
Group 1	.70 (16)		.30 (7)
1958			
Group 2	.23 (7)		.77 (24)

Transition Matrix 2 (1961-1963)

	Group 1	1963	Group 2
Group 1	.70 (16)		.30 (7)
1961			
Group 2	.10 (3)		.90 (28)

Transition Matrix 3 (1963-1965)

	Group 1	1965	Group 2
Group 1	.74 (14)		.26 (5)
1963			
Group 2	.03 (1)		.97 (34)

Table 3.6 (continued)

	Group 1	Group 2
Group 1	.708	.292
Group 2	.113	.887

Stationary hypothesis $\chi_4^2 = 6.6$, $p \sim .16$

Order zero versus order one $\chi_1^2 = 60.$, $p < .001$

Order one versus order two $\chi_2^2 = 2.1$, $p \sim .35$

Powers of Stationary Matrix for Girls' Roe Level of Occupational Aspirations

	Second Power (1958-1963 Transitions)		
1958	Group 1	.534	.466
	Group 2	.180	.820
	Third Power (1958-1965 Transitions)		
1958	Group 1	.431	.569
	Group 2	.220	.780
	Fourth Power (1958-1967 Transitions)		
1958	Group 1	.369	.631
	Group 2	.244	.756
	Limiting Matrix (Equilibrium at 14th Power)		
	Group 1	.279	.721
	Group 2	.279	.721

Table 3.6 (continued)

Test of Fit of Stationary Matrix Against 1967 Observations

Transition Matrix 4 (1965-1967)

		Group 1		Group 2
Group 1	Observed	.47 (7)	Observed	.53 (8)
	Expected	.708 (10.6)	Expected	.292 (4.4)
	χ^2	= 1.22	χ^2	= 2.95
1965				
Group 2	Observed	.03 (1)	Observed	.97 (38)
	Expected	.133 (4.3)	Expected	.887 (34.7)
	χ^2	= 2.53	χ^2	= .31

Goodness of fit hypothesis $\chi_2^2 = 7.01$, $.025 < p < .05$

Test of Fit of Fourth Power of Stationary Matrix
Against 1958 to 1967 Transitions

		Group 1	1967	Group 2
Group 1	Observed	.174 (4)	Observed	.826 (19)
	Expected	.369 (8.5)	Expected	.631 (14.5)
	χ^2	= 2.38	χ^2	= 1.39
1958				
Group 2	Observed	.129 (4)	Observed	.871 (27)
	Expected	.244 (7.6)	Expected	.756 (23.4)
	χ^2	= 1.70	χ^2	= .55

Goodness of fit hypothesis $\chi_2^{22} = 6.02$, $p \sim .05$

school. The new data are discouraging for the Markov chain theory for these patterns, but more importantly the trends in the patterns are discouraging for girls who in early adolescence are high career aspirers.

3.3 Summary

We have turned to Markov chain analysis because we need methodology that treats patterns in time series on career adjustment variables as patterns. At least the chain model acknowledges the existence of a continuing process and attempts to describe its inherent lawfulness. The trouble is that the assumptions the chain model makes about the simple ways the history of the subject on the variable may affect his next observation value are unrealistic. Actually, we have in hand some Markov chain theory matrices that stand the test of new data better than one would expect. The problem is how to capitalize on what loose but reasonable fits of chains we can obtain. We have suggested using the best fitted chain as a null hypothesis, letting it account for what variability it can, and then asking what trait-statistical prediction can do to account for the remaining variability. Although we do not have a very persuasive example, we believe the new combined Markov: statistical prediction system we have described and demonstrated has great promise for longitudinal research on human development. We will discuss how it could operate in a career guidance system later.

Chapter 4

Trial: Six Years Beyond High School

4.1 Career Tree Branch Tips

CDS terminates its empiricism with a sixth data collection conducted in early 1969, when the average age of the subjects is almost 25. According to Super's developmental model (Table 1.1) they are probably completing the last or Trial Substage of Exploration, in which final vocational commitments are likely to crystallize. Appendices E1 and E2 reproduce the information schedules for this data collection, and Appendix E3 reports the basic responses of the subjects. Two young men are dead, one in an automobile accident and the other in the Vietnam War. One young man who completed college could not be located. As shown by Table 4.1, slightly more than half the subjects are currently married, with more women married than single. (There have been half a dozen divorces, and three of the currently single women are divorcees.) Two problems, one per sex, have plagued us in our analyses of career patterns, and have also plagued many subjects in their career adjustments. For the men, the problem is their military obligation, which we can only view as a disaster for personal and scientific rationalization of career development. For the women, the problem is the construction to be placed personally and scientifically on housewifery. Fortunately the latter problem seems to disturb the analyst more than it does the women. It is noteworthy that 44% of the young women are still single six years beyond high school. For them at least the rubrics of career development are indisputably relevant. For the rest, we can only join them in their oft-stated conviction that housewifery is a proud vocation and by itself or intermixed with other occupations basis for a meaningful career.

Table 4.1: Marital Status of CDS Subjects in 1969

	Married	Single	Total
Male	26	28	54
Female	30	24	54
Total	56	52	108

Throughout this report we have relied heavily on a four-category criterion variable inspired by the Career Development Tree (Cooley and Lohnes, 1968). This variable combines the basic orientation dichotomy of technology orientations ("thing") versus sociocultural and business orientations ("people") with the basic educational level dichotomy of college versus non-college. Thus we have these groups:

mnemonic	career tree group
CS	college science
NT	non-college technology
NB	non-college sociocultural and business
CB	college sociocultural and business

Although the full tree model has 12 branch tips (see Figures 2.2 and 2.3), we have employed only these four major branches because of our small sample size. We will argue later that this fourfold discrimination is a sufficiently detailed mapping of the world of work for junior high school guidance purposes anyway. In Table E3 of Appendix E the 1969 category value for each subject is arrayed beside the actual occupation. Table 4.2 reports the frequencies for the four categories by sex and for total sample, while Table 4.3 displays the basic orientation breakdown by sex and Table 4.4 the college versus non-college sex break. Only 25% of our subjects have achieved or are still pursuing a college education in 1969, as contrasted with 53% whose 8th grade self-concepts included expectations of college educations. That 17 males and only 10 females have arrived in the college category six years beyond high school is foreshadowed by the 8th grade break of 38 boys and 20 girls expecting to achieve college degrees. That the majority of males fall in the "thing" orientation category and the majority of females in the "people" orientation category is not surprising. That only 28% of all our subjects have arrived in science or technology vocations does tend to temper our appraisal of this as a technological civilization.

Table 4.2: Sex X Career Tree Branch Tips Frequencies

	Career Tree Branch Tips				
Sex	CS	NT	NB	CB	Total
Male	4	18	19	13	54
Female	5	4	40	5	54
Total	9	22	59	18	108

Table 4.3: Sex X Orientation

	Orientation		
Sex	Thing	People	Total
Male	22	32	54
Female	9	45	54
Total	31	77	108

Table 4.4 Sex X Education

	Education		
Sex	College	Non-college	Total
Male	17	37	54
Female	10	44	54
Total	27	81	108

The Markov chain data tables reported in Tables 3.1 and 3.2 show the history of this career tree variable in our investigation through the 1967 data. It is interesting to compare the proportions of subjects whose 8th-grade aspirations placed them in each of the four categories in 1958 with the proportions for 1969, as presented in Table 4.5. The remarkable growth of membership in the NB category is due mainly to the fact that few girls identified housewifery as a career goal in 1958, while many have chosen or accepted it as such in 1969. Table 4.6 brings the chain transitions data up to 1969. This final observation distribution is not reasonably close to the theory matrix fitted to the first three transitions (Table 3.2), but it is not entirely unlike it either. The diagonal values are rather similar. This late in the game, however, there are a number of off-diagonal transitions that are not being made by any or many of the subjects. Table 4.7 shows a Markov chain theory matrix fitted to all five available transition matrices. Comparison with Table 3.2 indicates it to be remarkably like the theory matrix fitted to the first three transitions, but the increased numbers of degrees of freedom for the two goodness of fit tests we want not to reject on now lead to rejections on both (whereas we had previously accepted stationarity and rejected order

Table 4.5: 1958 and 1969 Sample Proportions in Tree Groups

	Career Tree Branch Tips			
Year	CS	NT	NB	CB
1958	.30	.15	.22	.33
1969	.08	.20	.55	.17

Table 4.6: Final Transition Proportions for Career Tree Variable (Frequencies in Brackets) for 1967-1969

1967 Groups	1969 Career Tree Groups			
	CS	NT	NB	CB
CS	.46 (5)	.18 (2)	.09 (1)	.27 (3)
NT	.05 (1)	.68 (13)	.26 (5)	.00 (0)
NB	.00 (0)	.06 (3)	.94 (46)	.00 (0)
CB	.10 (3)	.17 (5)	.23 (7)	.50 (15)

Table 4.7: Markov Chain Theory Matrix Fitted to Five Observed Transitions Between 1958 and 1969

	Career Tree Branches			
	CS	NT	NB	CB
CS	.53	.21	.03	.23
NT	.13	.65	.13	.09
NB	.01	.05	.91	.03
CB	.04	.07	.23	.66

For stationarity hypothesis, $\chi_{48}^2 = 67$, $p < .01$

For order one versus order two, $\chi_{36}^2 = 62$, $p < .01$

For order zero versus order one, $\chi_{9}^2 = 618$, $p < .001$

oneness). Our overall impression is that the behaviors of our subjects over eleven years on this career goals variable is too complex to be described adequately by a simple probability model. This conclusion reassures us that we have in hand a suitable criterion variable for attempts at trait-statistical prediction.

4.2 Prediction of Terminal Career Goals from 8th Grade Traits

Are the 1969 career tree branch memberships of the CDS men and women contingent upon their 1958 values for the personality factors of intelligence (IQ) and vocational maturity (RCP)? Are these germinal goals contingent upon 1958 socioeconomic status (SES) of their families? How contingent on sex is the career tree variable in this final observation of it? What is the best linear combination of these four predictors for this terminal view of the criterion? How has the predictability of the career tree categories changed over time? The multivariate analysis of variance (MANOVA) and multiple group discriminant analysis provide a data analysis strategy for inferences on these questions. Table 4.8 reports the required MANOVA study. It ranks the contingency relations in the order SES, IQ, and sex, with RCP a poor fourth. Review of Table 2.34 indicates that for the career tree criterion measured in 1967 the MANOVA ranking of the predictors was the same, although the fourth-place $\underline{F}$ value for RCP was not as weak. Review of Tables 2.28 and 2.30 reminds us that in the high school years of 1961 (10th grade) and 1963 the rankings were different, with sex and RCP showing the strongest predictive validities for the career tree branches. Perhaps the most interesting feature of Table 4.8 is that the highest RCP mean does not belong to the group that has the best SES and IQ means.

The multivariate eta-square value of .41 for the 1969 tree criterion in the space of the four predictors reveals only a modest shared variance between criterion and predictors. However, the values of .48 and .49 for this statistic when the criterion was measured in 1967 and 1958 (Table 4.9) indicate that the strength of the overall contingency, never very strong, does not fall off radically over the eleven years. These values are comparable to canonical correlation coefficients in the .65 to .70 range and are not negligible. Table 4.9 enables us to compare the best linear discriminant functions for the tree criterion in the space of the four 1958 predictors when the criterion is measured in 1958, 1967, and 1969. The best functions (df1) for 1967 and 1969 are very much alike, correlating strongly with SES and IQ, and the second best functions (df2) for these years are also similar, although the emphasis switches from IQ and sex in 1967 to sex and IQ in 1969. In the 1967 and 1969 studies df1 separates the two college groups from the two non-college groups and df2 tends to separate the predominantly male non-college technology group from the other three groups. However, in the 1958 study it is df2 based on RCP that separates the college from the non-college groups, while df1 based on sex separates the two "thing" oriented groups from the two

Table 4.8: MANOVA Study; criterion is 1969 career tree variable; predictors are 1958 sex, SES, IQ, and RCP (N = 108)

	Career Tree Groups					
Four Scales	College Science (N = 9) Means	Non-coll Technol. (N = 22) Means	Non-coll Business (N = 59) Means	College Bus-cult (N = 18) Means	Pooled-groups est. S.D.s	F^{3}_{104}
Sex*	1.6	1.2	1.7	1.3	.5	6.8
SES**	2.2	4.3	4.4	3.0	1.5	8.9
IQ	115.6	103.2	106.6	113.6	8.7	7.4
RCP	33.3	32.6	30.9	37.8	9.1	2.0

For equality of dispersions, MANOVA $F^{30}_{\infty} = .7$

For equality of centroids, MANOVA $F^{12}_{267} = 5.0$, $\eta^2 = .41$

*Male = 1; female = 2

**Highest socioeconomic status = 1; lowest status = 7

Table 4.9: Correlations of two discriminant functions with the four 1958 predictors for discrimination of career tree criterion groups in 1958, 1967, and 1969 data, with eta (canonical R) and proportion of predictor battery extracted by each discriminant, and criterion group centroids on discriminant functions. (Functions have unit standard deviation for total samples.)

	1958		1967		1969	
Predictors	df1	df2	df1	df2	df1	df2
Sex	-.87	.02	-.47	.68	-.37	.87
SES	-.43	-.43	-.75	-.08	-.82	-.17
IQ	-.04	.50	.59	.73	.67	.49
RCP	.06	.92	.54	.08	.37	-.16
Eta (Canon R)	.56	.50	.61	.38	.54	.40
Variance Extracted	.24	.32	.35	.25	.35	.26
Group Centroids						
College Science	.40	.45	.50	.18	1.03	.50
Non-coll Technol.	.92	-.81	-.23	-.80	-.12	-.73
Non-coll Business	-.72	-.52	-.54	.23	-.37	.23
College Sociocultural and Business	-.29	.28	.85	.06	.84	-.10
MANOVA eta-square	.49		.48		.42	

"people" oriented groups. The details of the three discriminant analyses differ enough to reinforce our conviction that the dynamics of this career goals variable viewed as a process variable over eleven years of crucial development are complex and changing. That the changes are in the direction of increased dependence on adolescent SES and IQ is sobering, especially as we ponder the well-known interdependence, premised partly on genetic mechanisms, of these two predictors. We have to feel that our subjects are working out their fates as well as their plans in what Super has aptly termed the process of compromise.

Table 4.10 reports classifications of the subjects into predicted 1969 tree groups computed from their 1958 trait profiles, sorted according to their actual 1969 group memberships. A majority of the CS, NT, and NB groups are correctly classified, but only 38% of the actual CB group members are placed in the CB group. Why some of these college sociocultural and business subjects who "look more like" college science subjects are not pursuing science or technology careers is a nice question.

Table 4.10: Classification Outcomes for 1969 Tree Groups in Space of 1958 Sex, SES, IQ, and RCP (N = 108) (All entries are percentages of row totals.)

	Predicted Groups				
Actual Groups	CS	NT	NB	CB	Actual %
CS	66	0	22	11	8
NT	4	63	18	13	20
NB	13	27	52	6	54
CB	27	22	11	38	16
Predicted Percentage of total N	18	31	36	13	

Total percentage of hits = 53

Total percentage of misses = 47

Since level of educational attainment is particularly valued in our society, we have looked at it in more detail in a MANOVA study reported in Table 4.11. Again we see that SES is the strongest indicator, with IQ also a strong indicator. The really remarkable

Table 4.11: MANOVA Study; criterion is 1969 educational attainment in five levels; predictors are 1958 sex, SES, IQ, and RCP (N = 108)

	1969 Levels of Educational Attainment						
Four Scales	Grad School (N=10) Means	BS or BA (N=12) Means	HS + 2 or 3 yrs (N=21) Means	HS + 1 yr (N=27) Means	HS only (N=38) Means	Pooled-groups est. S.D.s	F^{4}_{103}
Sex	1.3	1.3	1.4	1.5	1.6	.5	1.0
SES	2.0	3.3	3.5	4.0	4.9	1.4	10.6
IQ	118.3	112.3	109.6	105.2	104.5	8.6	6.8
RCP	35.1	37.3	33.6	31.3	30.8	10.8	1.1

For equality of dispersions, MANOVA $F^{40}_{\infty} = .7$

For equality of centroids, MANOVA $F^{16}_{306} = 3.6$, $\eta^2 = .41$

Note: for this criterion in space of 1958 eight RVP scales,

MANOVA $F^{32}_{355} = 1.07$ and $\eta^2 = .29$

thing about Table 4.11 is that with but one slight discrepancy (RCP means for the graduate school and BS or BA groups), the five groups are colinear on all four variables, and we may summarize the study with the generalization that educational attainment in early adulthood increases with increasing early adolescent SES, IQ, maleness, and RCP of sub-samples. One discriminant function absorbs almost all the discriminating power of the battery, as we might expect from the colinearity of the groups, and the groups are properly aligned on it. The correlations of the predictors with df1 are

SEX	-.31
SES	-.85
IQ	.72
RCP	.27

and the canonical correlation of df1 with the weighted function of the group memberships is .62. The discriminant function extracts 35% of the predictor battery variance. Note that the MANOVA η^2 for this study is very similar to that for the 1969 career tree criterion.

4.3 Summary

We observe with sadness that our small group of young men has not escaped the scythes of the war in Vietnam and the war on our highways. With some surprise we note that at average age of almost 25 over half of the CDS men and almost half of the women are single, and that only one quarter of the subjects have achieved or are still pursuing a four-year college education. Similarly surprising is that only about one quarter are placed terminally in science or technology vocations. In the 8th grade fully half the subjects expected to achieve four-year college educations, and 45% planned on science or technology vocations. Particularly problematic is why the large majority of our college-achieving males has finally eschewed science or technology careers. Their military service obligations have perturbed the career patterns of the men in many ways. Housewifery has emerged as a chosen or accepted career for many women who did not nominate it when they were interviewed in the 8th grade.

The Markov chain theory fitted to the first three transitions on the Career Development Tree variable never did fit the data very well, but in the 1969 data there remain signs of some coherence between the theory and the data. A Markov chain fitted to all the available data for five transitions is remarkably similar to the one fitted to the first three transitions. The impression is that much of the variance in the career tree patterns needs to be explained by external predictors.

The trait-statistical prediction of the 1969 career tree tips distribution showed the strongest relations to be with 1958 SES and IQ, even as in the 1967 criterion data. This finding is in marked contrast to the finding of strongest contingencies with sex and 1958 RCP in the 1958, 1961, and 1963 criterion data. Our impression is that the career tree variable is a complex process variable the dynamics of which depend less on self-concepts and more on the hard realities of social status and intelligence as the subjects mature vocationally. Level of educational attainment as a terminal value for the educational aspiration process variable appears to be constrained by the same dynamics as the career tree variable tips, and the shifts over time are much the same for both processes. These studies of eleven-year career patterns convince us that our subjects are integrating their fates and their plans through a dialectic of compromise.

PART II

IMPLICATIONS FOR EDUCATION

Men work to live. Regardless of what wonders of freedom from the necessity of work for the masses of humanity the future may hold, education still has to equip today's youth for psychological and sociological adjustments to living with the imperative of working. If education is to enable men to live in freedom rather than as slaves to necessity, it must show them how to transform a fate which is a future of work into a plan for a career. One primary measure of the success of education is the extent to which its clients go on to realize the satisfactions and render the contributions of productive careers. A life should be much more than just a career, and education should liberate intelligence generally, enabling adjustment to all the predicaments of the human condition, as well as cultivating understandings and personal initiatives leading to careers (Lohnes, 1967), but for the moment we are constrained to focus on the latter mission. However, we acknowledge squarely as should all guidance educators that no career guidance program can possibly succeed in its special goals unless it is associated with a general educational program that liberates intelligence (Murphy, 1961) and orients students to the great human predicaments (Tiedeman, 1967).

What should be the special educational goals of a career guidance program, and what should be its methods? We have in hand lengthy reports on three major longitudinal studies of career development: the Career Pattern Study (CPS), brought up to age 25 by Super, Kowalski, and Gotkin, Floundering and Trial after High School, 1967; Project TALENT, as reported by Cooley and Loynes, Predicting Development of Young Adults, 1968; and the Career Development Study (CDS), reported on in Gribbons and Lohnes, Emerging Careers, 1968, and further extended by this text. Although our thinking has been influenced by many other sources, we are going to concentrate particularly on the implications we see for education in the findings of these three studies.

What are the major findings of these longitudinal studies of career development? First, they have shown that career patterns can be conceptualized, operationally defined, measured, and predicted. Thus they have justified their eschewing vocational criteria for career criteria. Where the traditional vocational criterion was a single event observed at a single point in time, the career criterion is a transition in a variable observed twice at two different points in time, or a string of such transitions over several time periods. It has been shown that such transitions are in part predictable from probability laws fitted to the career process variables themselves and in part predictable from antecedent trait profiles of subjects. From a prediction system that combines these two types of predictability potentially useful projections of possible futures for guidance clients can be computed. Such computed projections have been called prognostic probabilities (Cooley and Lohnes, 1968), and a computer measurement system (CMS) has been described which would produce them for guidance purposes (Cooley, 1964).

Although a variety of career variables have been treated successfully in pattern analyses, the Career Development Tree from Project TALENT research appears to be the most utilitarian mapping of career patterns over adolescence and into young adulthood, as we consider the needs of school guidance clients. A curriculum that would promote understanding of this mapping would produce a considerable sophistication in world view which would then provide a frame of reference for explorations of personal multipotentiality in interaction with the CMS.

These researches along with others have shown that the predictors the CMS will have to incorporate as inputs to the computation of career predictions include

- Current Career Plans
- Sex
- Socioeconomic Status
- Ability Factors
  - Verbal Knowledges
  - Mathematics
  - English
  - Visual Reasoning
- Vocational Maturity Factors
- Scholasticism
- Interest Factors
  - Science
  - Cultural
  - Business
  - Outdoors and Shop.

CPS and CDS have concentrated on the assessment and validation of vocational maturity. The current summary of research from CPS states:

> Conceptually and empirically adequate measures of vocational maturity appear to be those which assess a boy's knowledge of education and training requirements for the occupations in which he is interested, together with certain other aspects of information, not so much because he will use those facts (or fictions), but because the possession of such information indicates an orientation to the world of work which will help him as the need for decisions, and for data on which to base them, arises. Planning is important for the same reasons, but

> less so. Interest maturity, as measured by Strong's Vocational Interest Blank, is also empirically sound as a measure of vocational maturity, (and) conceptually adequate because it measures similarity of interests to those of older (more mature) males . . . . (Super, et al., 1967, p. IX-17, 18)

We feel that CDS has shown how a structured junior high school guidance interview can yield a quantification of vocational maturity that can assist in the diagnosis of guidance learning needs and the making of decisions in the individualization of guidance services (see Appendix C). Nevertheless, we agree that CDS and TALENT findings support this CPS generalization:

> (CPS research) brings out the fact that the standard measures which are most widely used in the schools and in educational and vocational guidance are the best predictors of vocational development in young adulthood. (Super, et al., 1967, p. IX-18)

If the bright side of these researches is that they point the way to better information systems for career guidance programs, the dark side is that they show that the majority of adolescents are poorly oriented with respect to career development tasks and that fully one-third to almost one-half of young adults at age 25 appear to be in career development trouble. For example, CPS concludes:

> It is apparent that floundering is by no means an isolated phenomenon: approximately one-half of the job and training moves that a typical group of men make during the seven years after high school can be characterized as floundering. About one-third of young men can be classified as flounderers in this time period, and another fifteen percent flounder as often as they use more appropriate behavior. (Super, et al., 1967, p. VI-37)

CDS results corroborate this directly, and TALENT results support it indirectly. Furthermore, summarizing data on occupation satisfaction at age 25, CPS finds among its subjects "a total of only about 55 percent who are more than lukewarm about their work" (ibid., p. IX-6). A considerable threat to the objectivity of CDS data over the years has been posed by the frequency of overt requests for guidance from the subjects during the interviews. Statements of unsatisfied needs for guidance abound in the CDS protocols, as they do in TALENT's free-response sections of the followup questionnaires.

A shibboleth in our society is the vocational value of educational attainment. Education literally opens doors. These career researches combine to show in many ways that educational variables prefigure career variables. CPS now says flatly:

> Educational level attained by age 25 was related to career success. (Super, et al., 1967, p. VI-26)

The question for educators is whether we really communicate this shibboleth early enough and convincingly enough to our young clients, especially those who are not receiving it at home. We think that it is in failure to sponsor understandings of the career values of education that educators miss their main opportunity to promote the best career development possible in students.

Career guidance in our schools should begin in the elementary years with curriculum units designed to teach understandings and values of careers and education as they intertwine in our civilization. In the junior high years the student should begin to interact with a computer measurement system that will help him to assess his personality and project his multipotentiality. Through curriculum units he should continue to broaden his understandings of career psychology and sociology. He should return to the computer interaction periodically to test the consequences of intervening events in his personal development and make and revise decisions and plans. He should have access to a counselor who can help him with the emotional and subtle intellectual ramifications of self-exploration, especially when discontinuities occur in orderly progress through developmental tasks.

Ways must be found to communicate the scientific knowledge we now have about career development to young people in our schools in modes that encourage better relations of self to society, better self direction and more acceptance of responsibility for personal history. The knowledge is technical, involving probability laws and trait-statistical maps. It requires computer communication. We must have a Computerized Career Information System as an integral part of a Career Guidance Curriculum in our schools. Needless to say, we must also continue to expand and improve the enterprise of Career Development Research which provides the knowledge that gets translated into pedagogy by educators and into personal initiatives by students.

APPENDIX A

Instruments for HS+4 Data Collection

A1: HS+4 (1967) Interview Schedule

1. Have you had any formal education, including any training programs, since our last meeting? (if yes, hand E-T form)
   School:
   Field of concentration or specialty:
   Dates Attended:

2. If "No" above: Is there any particular reason why not?
   E.G. Did you feel you didn't need it, couldn't finance, weren't accepted?

3. What are your favorite subjects--part of training program?
   Why?

4. Which subjects--part of training program--did you like least?
   Why?

5. In which subjects did you attain your best grades?

Subjects	Grades

6. In which subjects did you receive your least satisfactory grades?

Subjects	Grades

7. Have you changed your major? Why?

8. Have you changed schools since you started your formal education? If yes, Why? How did you select the first school?

9. (If S has not completed education) Can you tell me why you left school?

10. Do you have any plans for going back? When? Where? Field?
    Final degree/goal?

11. Were you accepted at any school that you turned down?
    (or training program) Why?

12. Did you apply for admission to any school/training program that refused admission? Why?

13. How are you financing your education?

14. Have you been in the military--or have plans for military service?
    Branch   Term of Service
    Enlisted _____ Drafted _____
    If yes, hand Military Form.
    If not, could you tell me why not?

15. Would you tell me something about your interests? (general, at work/school)

16. Which of these activities have you enjoyed most?

17. Have you participated in any activities you've disliked or regretted? Why?

18. Which of your activities do you feel you've done particularly well in?

19. Have your leisure-time activities affected your career plans/choice?

20. There are often turning points in life where making the right decision or taking advantage of a lucky break can make a great deal of difference. Looking back over the years since you entered high school, can you now see turning points that were of real benefit to your career development? By C. D. we mean the sequences of educational experiences as well as jobs that lead to a final occupation. Please tell me what they were and how they helped.

21. What are your plans for immediately after graduation or service?

22. Where do you plan to live? Why?

23. (If S has moved) When did you move? Why?

24. Have local conditions affected your/your husband's career?

25. What particular field or kind of work do you EXPECT to be in five years from now?
    2nd expectation:
    3rd expectation:

26. How certain are you that you will settle down in this kind of work sooner or later?
    Certain   Fairly Certain   Uncertain

27. The last time we talked together, you thought you might like to be a ______________
    (If different now) Can you tell me what made you change your mind?
    (If the same now) Has anything in particular helped to reinforce this decision for you?

28. What is the best type of regular job you expect to attain in your life?

29. What age do you think you will be when you get this job?

30. Considering that you have to work for a living, what occupation would you choose if you had every opportunity to follow any occupation you wish? Why?

31. (If not the same as expectation) Is there anything you could do to make this possible?

32. Have there been any jobs you applied for but didn't get? Why?

33. Were there any jobs you were offered but didn't take? Why? (ask here how many jobs in last two years and give sufficient forms--explain that long job form is for major job--even if not in it at present)

34. What do you like best about your present job/going to school/being in service?

35. What do you dislike most about your present job/going to school/being in service?

36. Would you tell me about your general plans for the future?

37. We're interested in what you think are the most important facts to consider in making a decision about one's career. Could you tell me what you consider are the most important facts? (interests, abilities, values)

38. Would you tell me why you consider these factors important?

39. Do you feel that the occupation you enter is a matter of chance or choice? Could you tell me why you feel that way?

40. Do you feel that you have enough freedom to change jobs if you want to?
Please explain. (Housewife: ....freedom to take a job?)

41. What are some of your strong points...especially what abilities, personality traits, or special skills you have to offer to an employer?

42. What do you consider most important in a job?
(Probe) What would you like to get out of working?

43. What particular weaknesses do you think you have with regard to employment?

44. What could you do to correct this?

45. Have you found OR
Do you think you will find a job or jobs that will make use of the particular assets you have to offer? If yes, please describe. If no, why not?

46. What could you do to change this?

47. Do you feel that there is anything that prevents you from having the opportunities that others have? (e.g., physical handicap, responsibility for aged relatives, minority group membership.) Has this affected your career?

48. Many people feel in looking back that at certain points in their lives there were things that they did or failed to do that turned out to be mistakes and had a bad effect on their career development. Looking back over the years since you entered high school, what things would you do differently? (Define career development again if necessary: Sequences of educational experiences and jobs leading up to a final occupation.)

49. What special advantages have given you more opportunities than others? How have they affected your career?

50. What positive feelings do you have about work/the prospects of work?

51. What negative feelings do you have about work/the prospects of work?

52. How do you feel about the opportunities for someone in your field in your town?
If limited? What do you plan to do about it?

53. Are you married/plan to be married in the near future?

54. Has being/not being/plans for being married influenced your career? How?

55. What do you think you'd be doing now if you had not married?

56. (Housewives - not now employed)
Do you plan to go to work outside your home in the future?
When? What? Why?

57. (Employed housewifes)
Do you plan on changing jobs in the future? Or stopping work?
Details: When? What? Why?

58. How do you feel about continuing a career outside the home/or having your wife continue a career outside the home?

59. If affirmative: What plans have you made to make this possible?

60. What are your hopes for your children's education?

61. What are your hopes for your children's occupations?

62. What are your hopes for your husband/wife's education?

63. What are your hopes for your husband/wife's career?

64. Do you own a: Car____ Home ____ Business ____

65. How do you feel about your financial situation at the present time? Satisfied ____ Difficult ____ Impossible ____
If difficult or impossible: Do you see any way out?
Is there anything you can do to change the situation?

66. Are there things that you want to have or do but that you can't afford now?

67. When do you expect to be able to afford them?
Never ____ Perhaps someday ____ In a few years ____ Soon ____

68. Have you had any health, accident, or financial problems that might have affected your career?

69. How satisfied are you with your career development?
Probe: Is your life following the plan you set for it?

70. How do the people close to you feel about the direction your career is taking? I.e., the way things are going for you?
Family, husband/wife

71. (Married women) How do the people close to you feel about the direction your husband's career is taking?

72. What have been the major satisfactions in your life in the past two years?

73. What have been the major frustrations in your life in the past two years?

74. What would you like to get out of life? What do you think would make you happy and satisfied?

75. What things make you pessimistic about your future?

76. What things make you optimistic about your future?

77. Would you say you are more optimistic or more pessimistic about the future?

78. We talked about how you feel about yourself and your future. Can you tell me how you feel about the country or the world in general?
Probe for general optimism vs. pessimism, concern for uneasiness in social issues, sources of confidence, etc.

Person to contact in future ______
Address ______________________
Telephone ______________________

A2: Training and Education Form

CAREER DEVELOPMENT STUDY

Training and Education Form

Your Name ______________________

1. Name of school or training program ______________________

2. Is this school or organization a (please check one)
   - __ graduate or professional school?
   - __ 4 year college?
   - __ 2 year college?
   - __ business, trade or technical school?
   - __ military training program?
   - __ on-the-job or apprenticeship training?
   - __ correspondence course?
   - __ other (specify) ______________________

3. Major field or specialty ______________________

4. Location ______________________
   (street) (city) (state)

5. Dates attended from: ______________ to: ______________
   (month) (year) (month) (year)

6. Were you assigned (through no choice of your own) this training as part of an apprenticeship or on-the-job training?
   ___ Yes ___ No

   Why assigned? ______________________
   By whom? ______________________

7. Since you selected your school and/or major, which did you select first?
   - ___ the school (training program) you wanted?
   - ___ your major (specialty)?
   - ___ both of the above at the same time?

8. How did you find out about this particular school or training program? ______________________

9. Whom or what did you consult for information or advice when choosing it? ______________________

10. What did you know about the institution itself (school or training program) that made you want to go there? ______________

11. What evidence did you have that you had the necessary ability for this school or training program? ______________________

12. Why did you take this training? ______________________

13. What experiences helped you choose your major(s) or specialty (ies)? In answering, please consider counseling or advice, previous training and jobs, etc. ________________________________

14. Was this a school or college in which you could change your major or specialty if you wanted to? __ No ___Yes
If yes, did you change your major or specialty? __ No __ Yes
If yes, list the majors you had in this school in order, beginning with the first: ____________________________

15. Did you take any non-major courses at this institution?
__ No __ Yes.
If yes, how did they compare with your major courses? Check one description in each of the two columns below?

__ more valuable than major courses	__ more enjoyable
__ just as valuable	__ just as enjoyable
__ less valuable	__ less enjoyable

Comments: ____________________________

16. Did you originally take this training in order to prepare yourself for a particular job or field?
__ No __ Yes. If Yes, what job or field? ______________
If you changed your mind about the job or field, why?
____

17. a. Did this training help you to decide what job or field you would like to go into?
__ No __ Yes. If yes, what job or field? ___________
What aspects of the training helped you decide? ________

b. Did this training help you decide what job or field you did NOT want to go into?
__ No __ Yes. If yes, what job or field? ___________
What aspects of the training helped you decide? ________

18. Have you completed this training?
__ Yes. If yes, name the degree, diploma, or certificate you received: ________________________
__ No. If no, give reasons for leaving the school or not completing training? ____________________
Do you intend to complete it? __ No __ Yes.
When? ______________________________

19. How did you finance this training? ____________________

20. a. If this training actually led to a job, state here what it was: ______________________________

b. If this training did not lead to a job, please give brief explanation: ______________________________

21. DIRECTIONS: Below are several short statements about training. Each statement is followed by places for two ways of showing your reactions to it:

A - a place to describe HOW WELL you did it
B - a place to describe HOW SATISFIED YOU WERE WITH YOUR OWN PERFORMANCE

In Columns A and B there are five possible ways of answering. In Column A from 1, "Poorly," to 5, "Very Well"; in Column B from 1, "Very Dissatisfied," to 5, "Very Satisfied."

Please circle for each statement in each column the number that best describes your performance. (For example, you might circle 2 in Column A if you felt that you didn't do very well, but you might circle 4 in Column B if you felt satisfied about your performance because the work was difficult and you handled it as well as you could.) If you feel that you would like to comment further on the ratings you give any of the items below, check the item for your interviewer's attention.

A. HOW WELL DID YOU DO THIS?
- 1 - Poorly
- 2 - Not well
- 3 - Average
- 4 - Fairly well
- 5 - Very well

B. HOW SATISFIED ARE YOU WITH YOUR PERFORMANCE?
- 1 - Very dissatisfied with how I did
- 2 - Fairly dissatisfied
- 3 - Neither satisfied nor dissatisfied
- 4 - Fairly satisfied
- 5 - Very satisfied

			A					B		
	Poorly				Very Well	Very Dissatis.				Very Satis.
a. CARRYING THE LOAD OF WORK YOUR TRAINING PROGRAM REQUIRED (For example, the amount of work you had to turn out, the hours you had to put in, and the speed at which you had to work.	1	2	3	4	5	1	2	3	4	5
b. PERFORMING THE REQUIRED TRAINING TASKS (For example, laboratory or shop assignments, library research, the operation of machines, etc.)	1	2	3	4	5	1	2	3	4	5
c. GETTING ALONG WITH THE PEOPLE WHO TAUGHT OR SUPERVISED YOU (For example, getting along with instructors, advisors, deans, supervisors, etc.)	1	2	3	4	5	1	2	3	4	5
d. GETTING ALONG WITH YOUR FELLOW STUDENTS OR TRAINEES	1	2	3	4	5	1	2	3	4	5

22. DIRECTIONS: Below are listed some items describing various aspects of training. You are asked to rate each of the items on the two scales which follow each one. If you would like to explain further your ratings of certain of the following items in your interview, please check the item. Please answer every item.

	Scale I			Scale II				
	Please check one of the three places below which best fits your training or education.			Please check one of the five places below which best describes how satisfied you are with this aspect in your training or education.				
				Very Satisfied	Fairly Satisfied	Neither Satisfied nor Dissatisfied	Fairly Dissatisfied	Very Dissatisfied
a. Your grades or ratings.	___ High	___ Average	___ Low	___	___	___	___	___
b. Training expenses, such as tuition, books, carfare, lunches.	___ High	___ Average	___ Low	___	___	___	___	___
c. The amount you are expected to learn.	___ Great	___ Average	___ Little	___	___	___	___	___
d. The degree of difficulty of your training.	___ Great	___ Average	___ Little	___	___	___	___	___
e. How interesting the training is.	___ Great	___ Average	___ Little	___	___	___	___	___

				Very Satisfied	Fairly Satisfied	Neither Satisfied nor Dissatisfied	Fairly Dissatisfied	Very Dissatisfied
f. Pressure to meet deadlines, such as preparing for tests, writing reports, turning in homework.	___ Great	___ Average	___ Little	___	___	___	___	___
g. Amount of competition, such as competing with others for grades, honors, jobs, privileges.	___ Great	___ Average	___ Little	___	___	___	___	___
h. Usefulness of this training for your future.	___ Great	___ Average	___ Little	___	___	___	___	___
i. Opportunities to use your abilities.	___ Many	___ Some	___ Few	___	___	___	___	___
j. Hours in study or homework.	___ Many	___ Some	___ Few	___	___	___	___	___
k. The people who teach or supervise you.	___ Well qualified	___ Average	___ Unqualified	___	___	___	___	___

				Very Satisfied	Fairly Satisfied	Neither Satisfied nor Dissatisfied	Fairly Dissatisfied	Very Dissatisfied
l. The school or organization as compared with others you could have gone to.	____ Better	____ About the Same	____ Worse	____	____	____	____	____
m. Your major or specialty as compared with others you might have chosen.	____ Better	____ About the Same	____ Worse	____	____	____	____	____

23. a. How would you rate the quality of this training program, taken as a whole?

_____ Excellent
_____ Good
_____ Average
_____ Poor
_____ Very Poor

b. How would most of your fellow students rate it?

_____ Excellent
_____ Good
_____ Average
_____ Poor
_____ Very Poor

24. Did this training program turn out to be what you expected it to be?

_____ Yes
_____ No. If No, why not? ______________________________

25. Taking your experiences in this training as a whole, do you feel that you really belonged in this program?

_____ I felt that I really belonged there.
_____ I got along all right, but sometimes it was a strain.
_____ I often felt that I really shouldn't have been there.
Comments: ______________________________

26. How did this training or education contribute to your personal growth and career? ______________________________

A3: Job Form

CAREER DEVELOPMENT STUDY JOB FORM

Your Name ______________________

Name of Job ____

Dates held:
From ______________________ To ______________________
(month) (year) (month) (year)

Type of Business ___________ Name of Firm ___________________

Description of Job ____

Main Duties ____

1. At the time you had this job, if you could have had your choice of full-time jobs, which would you have chosen? (Check one.)

_____ This job.
_____ A different job, but in the same field of work.
_____ A different job, and in a different field of work.

2. This job

_____ could be done by someone just starting out in this line of work

_____ requires more skill, training, experience or time on the job than someone just starting out in this line of work would ordinarily be expected to have.

3. Comparing this job to the one you had immediately before, was it

_____ I had no job before this one
_____ a step up; why? ______________________________
_____ on the same level ____________________________
_____ a step down; why? ____________________________
_____ other (please explain) ________________________

4. DIRECTIONS: Below are listed some items describing various aspects of jobs. You are asked to rate each of the items on the two scales which follow each one. If you would like to explain further your ratings of certain of the following items in your interview, please circle the letter of the item. Please answer every item.

	Scale I Please check one of the three places below which best fits your job.	Scale II Please check one of the five places below which best describes how satisfied you are with the amount or degree of this aspect in your job. Very Satisfied	Fairly Satisfied	Neither Satisfied nor Dissatisfied	Fairly Dissatisfied	Very Dissatisfied
a. Earnings.	____ High ____ Reasonable ____ Low	____	____	____	____	____
b. Job security.	____ Great ____ Average ____ Little	____	____	____	____	____
c. The amount of responsibility you have.	____ Great ____ Average ____ Little	____	____	____	____	____
d. The amount of variety in your work.	____ Great ____ Average ____ Little	____	____	____	____	____
e. The amount of prestige you have.	____ Great ____ Average ____ Little	____	____	____	____	____
f. The degree of difficulty in your work.	____ Great ____ Average ____ Little	____	____	____	____	____
g. Opportunity for promotion or advancement.	____ Great ____ Average ____ Little	____	____	____	____	____

				Very Satis-fied	Fairly Satis-fied	Neither Satisfied nor Dissatisfied	Fairly Dissat-isfied	Very Dissat-isfied
h. Company benefits, such as sick pay and pension plans.	Many	Some	Few					
i. Opportunities to attain your ambitions.	Many	Some	Few					
j. Opportunities to use your initiative or judgment.	Many	Some	Few					
k. Opportunities to use your knowledge and experience.	Many	Some	Few					
l. Opportunities to express yourself.	Many	Some	Few					
m. Opportunities to share interests with fellow-workers.	Many	Some	Few					
n. Freedom to do things the way I want to.	Much	Some	Little					

5. When you first took this job, did you feel at the time that it was: (Please read all descriptions carefully and check only those that apply.)

___ a. A way to earn money for a special purpose, such as tuition.

___ b. Something to do as a stop-gap, such as between school and military service.

___ c. A way to broaden yourself as in travel.

___ d. A way to earn a living until something better came along (just another job).

___ e. Just a way to make good money.

___ f. A way of getting a feel for different kinds of work settings, such as working outdoors, or in an office.

___ g. A way to see if you would really like the kind of job you thought you'd like.

___ h. A way of finding out if you were good enough at a kind of work you wanted to do.

___ i. A steady job that you probably would want to stay with.

___ j. A way of getting started in the field you wanted to work in. (Please name field) ____________________

___ k. A way of getting ahead in the field you have already gotten started in. (Please name field) ____________

___ l. Other ____

Comments: ____

NOW WRITE IN THE LETTER OF THE ONE ABOVE THAT BEST DESCRIBES WHAT YOU FELT THE JOB WAS WHEN YOU TOOK IT: _______.

6. Did you later feel that this job was: (check only one)

___ Just what you thought it was going to be (in other words, the one you checked above in Question 5).

___ Not what you thought it would be, but one of the other descriptions in Question 5. Letter that now seems to fit is: _____.

___ Other ____

7. DIRECTIONS: Below are several short statements about jobs. Each statement is followed by places for two ways of showing your reactions to it:
   A - a place to describe HOW WELL YOU DID it
   B - a place to describe HOW SATISFIED YOU ARE WITH YOUR OWN PERFORMANCE

In Column A and B there are five possible ways of answering. In Column A from 1, "Poorly" to 5, "Very Well"; in Column B from 1, "Very Dissatisfied" to 5, "Very Satisfied."

Please circle for each statement in each column the number that best describes your job performance. (For example, you might circle 2 in Column A if you felt that you didn't do very well, but you might circle 4 in Column B if you felt satisfied about your performance because the work was difficult and you handled it as well as you could.)

A. HOW WELL DID YOU DO THIS?
   1 - Poorly
   2 - Not well
   3 - Average
   4 - Fairly well
   5 - Very well

B. HOW SATISFIED ARE YOU WITH YOUR PERFORMANCE?
   1 - Very dissatisfied with how I did
   2 - Fairly dissatisfied
   3 - Neither satisfied nor dissatisfied
   4 - Fairly satisfied
   5 - Very satisfied

			A					B		
	Poorly				Very Well	Very Dissatis.				Very Satis.
a. PERFORMING THE DUTIES OF YOUR JOB (For example, you may have to operate machines, figure up accounts, design plans or procedures, or handle customers skillfully.)	1	2	3	4	5	1	2	3	4	5
b. CARRYING THE LOAD OF WORK YOUR JOB REQUIRES (For example, the amount of work you have to turn out, the speed at which you have to work, the number of hours you have to work, and the things you have to lift or move.)	1	2	3	4	5	1	2	3	4	5

			A					B		
	Poorly				Very Well	Very Dissatis.				Very Satis.
c. ADAPTING TO PHYSICAL CONDITIONS ON THE JOB (getting work done in spite of interruptions or distractions, such as noise, heat, or crowded conditions, etc.)	1	2	3	4	5	1	2	3	4	5
d. GETTING ALONG WITH PEOPLE IN CHARGE (For example, taking and carrying out orders from department heads, supervisors, inspectors, foreman, etc.; making a hit with the boss.)	1	2	3	4	5	1	2	3	4	5
f. GETTING ALONG WITH YOUR FELLOW WORKERS	1	2	3	4	5	1	2	3	4	5
f. GETTING ALONG WITH THE COMPANY'S WAY OF DOING THINGS	1	2	3	4	5	1	2	3	4	5
g. GETTING PROMOTIONS AND SALARY INCREASES	1	2	3	4	5	1	2	3	4	5

8. Were you generally satisfied with this job?

Yes. Why? ______________________________

No. Why not? (check as many as you need to describe why you were not generally satisfied with this job and put two checks by your main reason for dissatisfaction.)

___ My interests changed.
___ I could not find an outlet for my interests.
___ My abilities were not good enough for this job.
___ There was no credit for doing a good job.
___ My work load was too great.
___ My family thought I could do better.
___ Poor working conditions (For example, dirty, noisy, too hot, too cold, and so forth).
___ No opportunity for advancement.
___ Not enough benefits.
___ I was treated unfairly.
___ I had no job security.
___ My abilities were better than those required for this job.
___ Pay was too low.
___ The other workers were hard to get along with.
___ There was too much supervision, not enough freedom.
___ I didn't feel I was going something really worthwhile.
___ Other (Explain) ______________________________

9. Do you now feel for any reason that you stayed with this job any longer than you should have? ___ Yes ___ No
Please explain: ______________________________

10. Do you now have this job?

___ Yes.
___ No. If no, why did you leave it? ______________
___ I was offered a better job in another company
___ I did not have enough training for it so I quit.
___ The job ceased to exist (Plant closed, lay-off).
___ I left to go to school.
___ I left to go into the service.
___ My family wanted me to leave.
___ I was dissatisfied with it so I quit.
___ I became sick.
___ I was promoted.
___ I was fired because (please explain) ______________
___ Other (please explain) ______________________________

11. How did you find this job? ______________________________

12. Beginning Salary __________
Present or Final Salary ________

CAREER DEVELOPMENT STUDY

Extra Job Form

Your Name ________________________

1. Name of job ____

   Dates held: From ____________________ To ____________________
   (month) (year) (month) (year)

2. How did you find this job? ____________________________________

3. Describe your main duties on this job: ______________________

4. Why did you take this job? ____________________________________

5. Why did you leave it? ____

6. Did you like it? ___ Yes ___ No

7. How much did you make each week?

   Starting _______ Final _______

A4: Military Form

CAREER DEVELOPMENT STUDY

Military Form

Your Name ____________________

1. Branch of service ____________________

2. Dates of active duty:

From ____________________ To ____________________
(month) (year) (month) (year)

Dates of inactive duty:

From ____________________ To ____________________
(month) (year) (month) (year)

Reserves or National Guard:

From ____________________ To ____________________
(month) (year) (month) (year)

3. Did you, or do you plan to, sign up for a second tour of active duty after your initial tour of duty?

___ No ___ Yes

If so, why? ____________________

4. Beginning grade or rank ____________________

5. Highest grade or rank attained ____________________

6. Final or present grade or rank on active duty ____________________

7. Did you at any time, before, during, or since your military service decide to make it your career?

___ No
___ Yes. If so, do you now intend to make the military service your career?

___ Yes
___ No. If not, why have you changed your mind? ____________________

8. a. Please give information requested below for ACTIVE DUTY, indicating your success and satisfaction with each major assignment by circling the appropriate number:
1 = very low, 2 = low, 3 = average, 4 = high, 5 = very high.

DATES from	DATES to	MAJOR ASSIGNMENT	DUTIES	LOCATION	YOUR SUCCESS	YOUR SATISFACTION WITH YOUR PERFORMANCE	YOUR SATISFACTION WITH YOUR DUTIES
					1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
					1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
					1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

b. Please give the same information for INACTIVE DUTY (Reserve or National Guard)

DATES from	DATES to	MAJOR ASSIGNMENT	DUTIES	LOCATION	YOUR SUCCESS	YOUR SATISFACTION WITH YOUR PERFORMANCE	YOUR SATISFACTION WITH YOUR DUTIES
					1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
					1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
					1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

9. What service schools have you attended while on active or inactive duty? Please list in chronological order, beginning with the first.

	Name of School (if Basic Training, so state)	Time Part	Time Full	Course studied	Length of Course From	Length of Course To	Certificate or Credit awarded
a.							
b.							
c.							

10. What correspondence courses did you take while in the military service? (inactive or active duty):

1.____
2. ____
3. ____

11. If you now intend to make the military service your career (full-time active duty), which of the schools mentioned in Question 9 have been most important for your military career? __________

12. If you do NOT intend to make the military service your career, are any of the schools mentioned in Question 9 important to your civilian career?

Name of school	Way it is important for your career
________________	________________________
________________	________________________

13. In general, how do you feel about your whole tour of duty?

___ more satisfying than dissatisfying
___ as satisfying as dissatisfying
___ more dissatisfying than satisfying

Why? ____________________________________

14. As far as your civilian career is concerned, do you feel that the time spent in the service (check only one)

___ was more of a help than a delay
___ helped about as much as it delayed
___ was more of a delay than a help

Why? ____________________________________

A5: Interest Inventory

In answering these items about occupations and activities, assume that you would have any necessary training or education that would be required. Disregard salary, social standing, permanence, etc., and answer in terms of how much you would like to do the work or the activity. We are not asking about your plans, but only about kinds of things you think you would enjoy doing. Work quickly and give your first impressions. Please answer all items. Write before each item the letter of the choice that best describes your feelings.

A. I would like this very much
B. I would like this fairly well
C. Indifferent or don't know much about it
D. I would dislike this a little
E. I would dislike this very much

___ 1. Bookkeeper
___ 2. Bank teller
___ 3. Surgeon
___ 4. Chemist
___ 5. Civil engineer
___ 6. Dentist
___ 7. Toolmaker
___ 8. Auto mechanic
___ 9. Butcher
___10. Tailor or dressmaker
___11. Dietician
___12. Cab driver
___13. Longshoreman
___14. Foreman
___15. College president
___16. Insurance agent
___17. Stock salesman
___18. Foreign correspondent
___19. Editor
___20. Musician
___21. Rancher
___22. Social worker
___23. Statistician
___24. Astronomer
___25. Research scientist
___26. Office clerk
___27. Plumber
___28. Electrician
___29. Fireman
___30. Dish washer
___31. Maid
___32. Personnel administrator
___33. Lawyer
___34. Reporter
___35. Sculptor
___36. Forester
___37. Elementary school teacher
___38. Nurse
___39. Chemical engineer
___40. Doctor
___41. Aeronautical engineer
___42. Secretary
___43. Technician
___44. Electronics technician
___45. Bricklayer
___46. Riveter
___47. House painter
___48. Building superintendent
___49. President of a large company
___50. Author of a novel
___51. Librarian
___52. Professional athlete
___53. Clergyman
___54. Certified Public Accountant
___55. Biologist
___56. Electrical engineer
___57. Mining engineer
___58. Typist
___59. Laboratory technician
___60. Repairman
___61. Beautician
___62. Railroad brakeman
___63. Shoemaker
___64. Factory worker
___65. Deliveryman
___66. Truck driver
___67. Building contractor
___68. Real estate agent
___69. Interpreter
___70. Writer

A. I would like this very much
B. I would like this fairly well
C. Indifferent or don't know much about it
D. I would dislike this a little
E. I would dislike this very much

___71. Musical composer
___72. Architect
___73. Decorator
___74. Sports umpire or referee
___75. Guidance counselor
___76. Accountant or auditor
___77. Mechanical engineer
___78. Mathematician
___79. Switchboard operator
___80. Machinist
___81. Welder
___82. Paper Hanger
___83. Carpenter
___84. Typesetter
___85. Office manager
___86. Banker
___87. Salesman
___88. College professor
___89. Poet
___90. Artist
___91. Designer
___92. Farmer
___93. High school teacher
___94. Religious worker
___95. School principal
___96. Member of President's cabinet
___97. Judge
___98. U. S. Senator
___99. Politician
___100. U. S. Congressman
___101. Mayor
___102. President of the U. S.
___103. Vice President of the U. S.
___104. State Governor
___105. Public administrator
___106. Take care of members of family
___107. Make out income tax returns
___108. Biology
___109. Physics
___110. Study muscles and nerves
___111. Calculus
___112. Keep records for a store
___113. Invent new tools
___114. Fix furniture
___115. Work on auto assembly line
___116. Wash and iron clothes
___117. Plan work for other people
___118. Own your own business
___119. Reading
___120. Fishing
___121. Basketball
___122. Tennis
___123. Raise sheep or cattle for market
___124. Help your parents
___125. Work arithmetic problems
___126. Prepare cost estimates
___127. Typewriting
___128. Make a radio set
___129. Fix a clock
___130. Operate a power machine
___131. Fire a person
___132. Manage a large store
___133. Write letters
___134. Practice music all day
___135. Art galleries
___136. Football
___137. Track
___138. Operate farm machinery
___139. Operate a calculating machine
___140. Physiology
___141. Chemistry
___142. Play chess
___143. Solve puzzles
___144. Do clerical work
___145. Repair an auto
___146. Operate a crane or derrick
___147. Work in steel mill
___148. Hire a person
___149. Supervise factory workers
___150. Sell furniture
___151. Trap wild animals
___152. Foreign language
___153. Teach children
___154. Help the poor
___155. Keep accounts
___156. Algebra
___157. Learn about diseases

A. I would like this very much
B. I would like this fairly well
C. Indifferent or don't know much about it
D. I would dislike this a little
E. I would dislike this very much

___158. Sell merchandise to stores
___159. Literature
___160. Write themes
___161. Symphony concerts
___162. Hunting
___163. Swimming
___164. Feed hogs and cattle
___165. Shop work
___166. Do odd jobs with small tools
___167. Direct people
___168. Arrange a strike settlement
___169. Poetry
___170. Play an instrument
___171. Visit museums
___172. Baseball
___173. Gardening
___174. Campaign for political office

A6: Occupational Aspirations

This set of questions concerns your interest in different kinds of jobs. There are eight questions. Each one asks you to choose one job out of ten listed. Read each question carefully. They are all different. Please answer all questions.

1. Of the jobs listed in this question, which is the BEST ONE you are REALLY SURE YOU COULD GET (assuming your schooling is over)? Check one job.

___ Lawyer
___ Welfare worker
___ Congressman
___ Army corporal
___ Supreme Court Justice
___ Night watchman
___ Sociologist
___ Policeman
___ County agricultural agent
___ Filling station attendant

2. Of the jobs listed in this question, which ONE would you choose if you were free to CHOOSE ANY of them you wished? Check one job.

___ Corporation board
___ Undertaker
___ Banker
___ Machine operator
___ Physician
___ Clothes presser
___ Accountant
___ Railroad conductor
___ Railroad engineer
___ Night club singer

3. Of the jobs listed in this question, which is the BEST ONE you are REALLY SURE YOU COULD GET (assuming your schooling is over)? Check one job.

___ Nuclear physicist
___ Reporter
___ County judge
___ Barber
___ State Governor
___ Store clerk
___ Biologist
___ Mail carrier
___ Labor union official
___ Farm hand

4. Of the jobs listed in this question, which ONE would you choose if you were free to CHOOSE ANY of them you wished? Check one job.

___ Psychologist
___ Store manager
___ State government official
___ Store clerk
___ Federal cabinet member
___ Janitor
___ Symphony musician
___ Carpenter
___ Radio announcer
___ Coal miner

5. Of the jobs listed in this question, which is the BEST ONE you are REALLY SURE YOU COULD HAVE by the time you are 30 YEARS OLD? Check one job.

___ Civil engineer
___ Bookkeeper
___ Minister, priest, or rabbi
___ Bus driver
___ Diplomat
___ Share cropper (tenant farmer)
___ Author of novels
___ Plumber
___ Newspaper columnist
___ Taxi driver

6. Of the jobs listed in this question, which ONE would you choose to have when you are 30 YEARS OLD, if you were FREE TO HAVE ANY of them you wished?

___ Airline pilot
___ Insurance agent
___ Architect
___ Milk route man
___ Mayor of a city
___ Garbage collector
___ Army captain
___ Garage mechanic
___ Owner-operator of a shop
___ Railroad section hand

7. Of the jobs listed in this question, which is the BEST ONE you are REALLY SURE YOU COULD HAVE by the time you are 30 YEARS OLD? Check one job.

___ Artist
___ Traveling salesman
___ Chemist
___ Truck driver
___ College professor
___ Street cleaner
___ Building contractor
___ Labor union official
___ Electrician
___ Restaurant waiter

8. Of the jobs listed in this question, which ONE would you choose to have when you are 30 YEARS OLD, if you were FREE TO HAVE ANY of them you wished?

___ Factory owner
___ Playground director
___ Dentist
___ Lumberjack
___ Scientist
___ Shoeshiner
___ Teacher
___ Lunchstand owner-operator
___ Machinist
___ Dock worker

A7: Work Beliefs

This checklist is made up of statements people often say they believe. You will find that you agree with some of them and disagree with others. Write an "A" before the statements you tend to agree with, and a "D" before the statements you tend to disagree with. Please answer all items.

___ 1. The only purpose of working is to make money.
___ 2. I don't like people who are always right on time for every appointment.
___ 3. I would be unhappy living away from my relatives.
___ 4. I like to try new things.
___ 5. I believe that a person can get anything he wants if he's willing to work for it.
___ 6. I would rather work than go to school.
___ 7. I believe that a man needs to work in order to feel that he has a real place in the world.
___ 8. I feel sorry for people who have to do the same thing every day at the same time.
___ 9. I hope to move to another state within the next few years.
___ 10. On the whole, the old ways of doing things are the best.
___ 11. Man should not work too hard, for his fortune is in the hands of God.
___ 12. Money is made to spend, not to save.
___ 13. I feel sorry for people whose jobs require that they take orders from others.
___ 14. I don't like to have to make appointments.
___ 15. People who can't leave their home towns are hard for me to understand.
___ 16. Life would be boring without new experiences.
___ 17. A man shouldn't work too hard because it won't do him any good unless luck is with him.
___ 18. I think there's something wrong with people who go to school for years when they could be out earning a living.
___ 19. Every man should have a job that gives him a steady income.
___ 20. I believe that promptness is a virtue.
___ 21. A man's first loyalty should be to his home community.
___ 22. I like people who are willing to change.
___ 23. With a little luck I believe I can do almost anything I really want to do.
___ 24. One gains more in the long run if he studies than if he gets a job.
___ 25. The happiest men are those who work only when they need money.
___ 26. I usually schedule my activities.
___ 27. When a boy becomes a man, he should leave home.
___ 28. On the whole, most changes make things worse.
___ 29. A person shouldn't hope for much in this life.
___ 30. The more school a person gets the better off he is.

A: Agree D: Disagree

___ 31. Doing a good job day in and day out is one of the most satisfying experiences a man can have.
___ 32. I'd rather let things happen in their own way than have them scheduled by a clock.
___ 33. I like to see new things and meet new people.
___ 34. The happiest people are those who do things the way their parents did.
___ 35. If a man can't better himself it's his own fault.
___ 36. Generally speaking, things one works hard for are the best.
___ 37. A regular job is good for one.
___ 38. It makes me feel bad to be late for an appointment.
___ 39. New things are usually better than old things.
___ 40. Practically everything I try to do turns out well for me.
___ 41. When I get a little extra money I usually spent it.
___ 42. I feel sorry for rich people who never learn how good it is to have a steady job.
___ 43. I expect people who have appointments with me to be right on time.
___ 44. I usually fail when I try something important.

A8: Activities Inventory

This inventory contains questions about the things you usually do and the way you do them. Your careful answers will be helpful in our effort to understand your career development. Please try to answer every question. For each statement write in the space to the left the letter of the one of the five choices which best describes how the statement applies to you. Here are the five choices with their code letters:

Regarding the things I do and the way I do them, this statement describes me
A - extremely well
B - quite well
C - fairly well
D - slightly
E - not very well

____ 1. I am the leader in my group.
____ 2. I am confident.
____ 3. I am never sloppy in my personal appearance.
____ 4. I make good use of all my time.
____ 5. I never seem to get things done on time.
____ 6. I talk a lot.
____ 7. I am a strong believer in customs and traditions.
____ 8. I like to spend a good deal of time by myself.
____ 9. I work fast and get a lot done.
____ 10. I am influential.
____ 11. When I say I'll do something I get it done.
____ 12. I can work or play outdoors for hours without getting tired.
____ 13. I'd rather be with a group of friends than home by myself.
____ 14. I like to tease people.
____ 15. I enjoy beautiful things.
____ 16. I work better with ideas than things.
____ 17. I believe that most things work out for the best in the end.
____ 18. I get along well with people.
____ 19. I often lose my temper.
____ 20. I have a definite place for all of my things.
____ 21. I'd enjoy speaking to a club group on a subject I know well.
____ 22. I feel that good manners are very necessary for everyone.
____ 23. I like to do things on the spur of the moment.
____ 24. It bothers me to leave a task half done.
____ 25. I do what the group decides to do even if I don't particularly like it.
____ 26. I have held a lot of elected offices.
____ 27. Being around strangers makes me ill at ease.
____ 28. Before I start a task, I spend some time getting it organized.
____ 29. I can turn out a lot more work than average.
____ 30. I am hard-working.
____ 31. People consider me the quiet type.
____ 32. People consider me an individualist.

Regarding the things I do and the way I do them, this statement describes me

A - extremely well
B - quite well
C - fairly well
D - slightly
E - not very well

___ 33. People seem to think I made new friends more quickly than most do.
___ 34. People consider me an efficient worker.
___ 35. My friends say I'm "bossy."
___ 36. I do my job, even when I don't like it.
___ 37. I am a fast walker.
___ 38. I couldn't get along without having people around me most of the time.
___ 39. I never hurt another person's feelings if I can avoid it.
___ 40. I think culture is more important than wealth.
___ 41. Philosophy interests me.
___ 42. I can't find much to be cheerful about these days.
___ 43. I get along very well with my teachers or supervisors.
___ 44. I can usually keep my wits about me even in difficult situations.
___ 45. It bothers me to be with someone who dresses carelessly.
___ 46. I'm troubled by people making fun of me.
___ 47. I know what is socially proper.
___ 48. I usually act on the first plan that comes to mind.
___ 49. I find it hard to keep working toward long-range goals.
___ 50. I'd give up my place on a team if that would insure that the team wins.
___ 51. People naturally follow my lead.
___ 52. People seem to think my feelings are hurt too easily.
___ 53. I like to do things systematically.
___ 54. I am productive.
___ 55. As soon as I finish one project, I always have another to begin.
___ 56. I am talkative.
___ 57. People say I tend to do things in the traditional way.
___ 58. I am usually at ease.
___ 59. I seem to know how other people will feel about things.

A9: Scores for HS+4 Inventories

MALES

			Interest Inventory					Activities Inventory				
Code	Occ. Asp.	Wrk. Bel.	Bus.	Out Shop	Cult.	Sci.	m-f	Conf.	Impl.	Soc.	Lead.	Intro.
001	39	33	141	147	125	67	199	46	4	04	1	05
002	54	35	068	101	071	62	121	37	5	10	1	06
003	56	35	047	019	045	32	077	46	4	06	0	12
004	40	26	093	079	071	25	106	48	1	10	4	11
005	60	23	059	064	065	51	101	42	1	05	3	11
006	49	28	114	054	070	46	102	27	6	05	3	05
007	70	33	097	060	092	36	104	43	3	02	5	11
008	49	27	057	044	078	46	117	30	5	04	1	11
015	41	39	067	050	125	42	114	50	2	08	4	11
016	36	35	128	072	097	77	137	51	3	11	1	09
017	24	36	086	147	068	59	174	51	5	09	0	09
018	64	28	052	022	099	31	076	37	7	04	3	11
019	44	30	105	049	067	48	104	50	1	11	1	10
020	28	35	050	148	075	25	130	49	6	10	1	10
021	36	31	072	124	066	52	157	54	0	08	1	09
028	60	38	137	090	126	80	178	57	1	12	3	10
029	65	35	126	078	091	60	130	50	3	11	5	08
030	56	35	067	022	066	03	041	48	3	11	3	11
031	53	29	080	075	086	55	113	47	4	08	2	09
032	50	34	057	122	074	69	154	39	2	05	0	07

			Interest Inventory					Activities Inventory				
Code	Occ. Asp.	Wrk. Bel.	Bus.	Out. Shop	Cult.	Sci.	m-f	Conf.	Impl.	Soc.	Lead.	Intro.
033	61	27	129	081	102	54	128	21	6	09	2	06
040												
041	49	34	090	103	110	77	167	22	1	08	1	05
042	30	31	121	119	035	13	097	46	1	12	3	07
043	37	32	115	083	093	51	141	23	7	09	0	09
050	41	34	030	026	028	38	068	47	1	01	2	11
051	36	31	092	110	057	54	116	36	2	08	0	05
052	38	37	146	103	103	65	152	52	2	10	2	10
053	39	31	137	124	095	70	164	49	1	11	4	05
054	37	30	085	062	053	41	093	34	3	01	0	10
055	37	31	096	084	092	42	107	10	2	03	0	10
056	41	37	107	053	078	17	097	62	1	10	3	06
057	48	33	081	102	112	77	181	48	3	11	3	11
064	26	36	116	083	079	45	130	31	4	09	1	08
065	34	29	068	142	079	37	129	53	1	07	2	06
066	35	37	070	116	037	47	133	34	3	09	1	05
067	54	35	070	016	122	33	104	51	4	07	2	07
068	51	35	131	147	120	72	202	56	3	11	2	11
069	36	37	100	074	115	46	145	43	1	09	2	10
076	34	33	137	117	095	63	172	33	2	11	0	07
077	34	37	123	050	089	41	126	27	1	10	1	05
078												
079	62	28	130	154	127	89	219	41	3	08	1	08
080	35	29	062	097	039	29	122	30	1	02	0	04
081	26	29	060	153	053	37	141	47	4	07	0	07

			Interest Inventory					Activities Inventory				
Code	Occ. Asp.	Wrk. Bel.	Bus.	Out. Shop	Cult.	Sci.	m-f	Conf.	Impl.	Soc.	Lead.	Intro.
090	19	31	140	179	104	56	211	45	5	09	2	09
092	49	38	122	089	091	50	132	48	4	08	4	09
093	31	32	108	189	095	75	216	48	2	10	0	05
096	59	37	108	118	097	81	188	56	3	07	4	05
099	47	39	084	111	064	62	137	44	1	06	2	06
100	42	30	085	122	076	77	177	39	1	08	0	03
102	39	39	119	074	085	52	122	60	4	07	4	07
104	37	35	085	055	059	30	086	44	0	09	1	06
106	43	36	122	087	100	65	130	59	2	07	5	13
108	43	33	104	137	107	78	191	51	1	09	2	09

FEMALES

			Interest Inventory					Activities Inventory				
Code	Occ. Asp.	Wrk. Bel.	Bus.	Out. Shop	Cult.	Sci.	m-f	Conf.	Impl.	Soc.	Lead.	Intro.
009	48	35	085	050	110	50	135	18	1	04	2	04
010	41	32	101	065	113	43	125	45	3	09	2	07
011	38	33	072	077	086	26	132	50	2	07	2	08
012	47	33	108	046	118	67	143	44	1	07	2	08
013	40	31	086	047	118	34	121	63	5	11	4	10
014	42	38	053	033	121	25	111	60	7	11	4	10
022	30	31	072	065	074	32	130	57	0	06	1	04
023	27	36	094	083	053	24	102	28	2	10	0	04
024	39	30	096	110	092	42	157	58	2	12	1	10
025	36	34	107	062	086	41	130	32	2	03	0	04
026	47	27	070	062	136	19	155	58	0	08	2	11
034	49	29	089	087	105	66	148	47	7	10	3	12
035	32	24	050	021	064	09	070	22	5	08	0	03
036	37	34	036	046	080	36	107	53	3	05	1	04
037	51	33	030	025	136	17	102	60	1	02	3	12
038	40	31	088	074	107	28	135	23	2	08	0	09
039	51	30	094	053	138	75	163	43	3	06	0	08
044	38	36	100	116	091	38	171	65	4	11	2	10
045	55	34	095	102	115	83	183	50	1	10	0	09
046	28	32	083	087	079	29	132	45	1	10	1	04

			Interest Inventory					Activities Inventory				
Code	Occ. Asp.	Wrk. Bel.	Bus.	Out. Shop	Cult.	Sci.	m-f	Conf.	Impl.	Soc.	Lead.	Intro.
047	52	39	054	055	129	57	118	55	1	05	0	11
048	31	27	117	034	090	05	093	43	4	05	1	07
049	30	32	072	077	130	37	154	27	3	07	0	07
058	45	31	039	063	135	27	120	25	2	10	1	04
059	47	33	085	069	112	44	146	52	2	09	2	07
060	52	26	075	063	085	55	123	41	3	12	2	11
061												
062	41	34	032	033	139	11	110	63	4	08	4	12
063	0	35	114	134	116	58	116	33	5	10	0	04
070	42	26	054	040	060	31	102	59	6	08	1	11
071	30	32	072	030	061	37	111	35	1	09	0	02
072	37	34	115	140	116	46	186	35	1	07	0	04
073	30	29	054	055	093	49	124	29	2	05	0	04
074	32	36	105	068	096	31	143	40	0	07	0	02
075	31	35	038	091	108	58	162	45	0	09	0	10
082	40	35	120	055	110	72	151	31	2	05	0	05
083	39	27	021	102	054	41	126	50	6	10	4	06
084	36	29	125	068	104	41	137	42	3	07	0	05
085	44	30	140	148	094	44	159	41	4	06	0	03
086	49	37	052	076	109	30	122	48	5	10	1	05
087	14	28	063	034	043	13	089	46	2	08	1	06
088	36	27	078	040	054	23	099	58	5	10	2	07
089	36	24	001	021	089	04	076	30	6	05	0	07
091	32	26	077	026	086	08	100	58	2	10	3	10
094	28	33	041	027	078	04	091	52	2	10	1	04

			Interest Inventory					Activities Inventory				
Code	Occ. Asp.	Wrk. Bel.	Bus.	Out. Shop	Cult.	Sci.	m-f	Conf.	Impl.	Soc.	Lead.	Intro.
097	50	29	088	124	075	59	158	54	1	11	0	04
098	50	33	027	096	094	51	136	35	4	08	0	04
101	34	33	061	057	043	22	092	52	3	01	1	05
103	51	29	60	113	121	76	185	33	5	09	0	04
105	43	35	94	148	125	43	192	33	1	05	0	08
107	39	29	61	046	055	12	090	60	1	02	1	03
109	32	35	28	028	105	06	084	48	1	08	0	11
111	30	35	97	077	095	43	149	51	1	09	2	07
027	No scores											

APPENDIX B

Scoring 12th Grade Vocational Maturity

B1: 12th Grade Interview Schedule

1. What curriculum are you taking now?

2. In the eighth grade you told us you thought you would take the __________ curriculum. Why did (or didn't) you change?

3. Who was especially influential in helping you make this decision?

4. If you were given another chance, would you make the same choice?

5. Now I'd like you to tell me something about these past two years in school. What have you done that you liked?

6. What do you feel you've done especially well?

7. What things have you disliked or regretted?

8. What would you consider your most important experiences in the past two years in school?

9. What tests have you taken in school during the past two years? Primer: Like I. Q., College Boards or Interests tests.

10. Have the results of these tests been given to you?

11. Would you tell me how you did on each of the tests you mentioned?

12. Has anyone at school explained what these scores mean?

13. Have these results helped you make your decisions about the future? Would you tell me how?

14. Do you plan to go any further in education? School:__________ Have you already applied? Have you been accepted? Type of school: ________. Major: ________. Number of years: ________.

15. How are you planning to finance this schooling? (Parents, working, scholarship)

16. Whom did you talk with before making your plans? (Parents, guidance counselor, friends)

17. Are you planning to enter an occupation (or go to a school) your best friend is going to?

18. Now I'd like to have you tell me a little about your occupational plans for the future. What occupation are you planning to enter? First choice: ________. What is your second choice?

19. Why have you chosen ________ as first choice?

20. To whom have you talked about this occupation?

21. How do you plan to reach your occupational goal? How will you prepare for it? How will you enter it?

22. What is the most important factor to consider in making an occupational choice?

23. Why do you consider this factor important?

24. In the 8th grade you were considering the possibility of becoming a ________ and in the 10th grade a ________. Will you tell me what made you change your mind (or keep same plans)?

25. What do your parents think of your educational and/or vocational plans?

26. Do you feel that the occupation you enter is a matter of chance or choice? Explain: Could you tell me why you don't (or do) think it is a matter of chance?

27. Would you tell me something about your interests? (Primers: hobbies, activities)

28. Which of these activities have you enjoyed?

29. Which of these activities do you feel you have done well in?

30. Have you participated in any activities that you've disliked or regretted?

31. Has your experience with any of these activities helped you in deciding on your future occupation?

32. What would you like to get out of life? What do you think would make you happy and satisfied?

33. What would you like to get out of work?

34. Would you tell me something about your strong points? The things you do well in.

35. Would you tell me something about your weak points? The things you wish you could do better.

36. If we divide the class in four quarters, in which quarter would you place yourself for scholastic ability, that is over-all school ability?

37. For verbal ability, the kind of ability you need to do well in English or History?

38. For mathematical ability or the ability needed to do well in math and science?

39. How certain are you about your educational and vocational plans we have been discussing? Would you tell me why you feel certain (or uncertain) about your plans?

40. If you cannot go to ________College (or occupation mentioned) what do you think you will do?

41. Do you have any plans for military service?

42. Do you have any plans for marriage? Are you going steady? Do you think your plans for marriage will make any difference in your future occupational goal?

43. Can you tell me something about how you feel about going to work? Probe: Are you looking forward to it?

44. When you think about work is there anything that you feel would be disagreeable about it?

45. What jobs have you had during the past two years? Which did you enjoy? Which did you dislike?

46. What occupation would you like to be in five years from now?

47. What occupation do you expect to be in five years from now?

48. If not the same, is there anything you could do to make them the same?

49. Would you say in general that these last two years have been good or bad years for you? Why?

50. What have been two or three of the best things about them?

51. What have been two or three of the most difficult things?

52. What advice would you give to a boy or girl just about to enter high school that you wish someone had given you?

Ask how feels about being in Career Development Study.
Tell about plans to talk to them in two years.
Address where can be reached.

B2: Scoring Manual for Measures of Vocational Maturity from Twelfth Grade Protocols

The purpose of this interview is to evaluate the student's vocational maturity as indicated by:

1. his self-appraisal in terms of values and interests and the extent to which they have shaped his vocational decisions.
2. evidence that he sees himself as an agent in determining the course of his career, i.e., the degree to which he is genuinely concerned with choice, has become actively involved in his vocational plans and is generally satisfied with their current progress.
3. the extent to which he has participated in activities that provide opportunities for implementing the self-concept and for self-assessment in roles similar to those in the career to which he aspires.
4. his appraisal of success in meeting the problem of occupational, educational and personal decision-making over the past two years, and the attitude with which he views the future.
5. evidence that his decisions have been based on information from valid sources and informed persons.

Scoring Procedure

1. Study the interview schedule to become thoroughly familiar with each question.
2. Read the general rules for scoring.
3. Read the specific rules under each dimension and the examples accompanying the questions.
4. Read the responses to questions 1, 2, 9, 10, 11, 14, 18, 24, 27, 36, 37, 38, from each interview to obtain background information on the abilities, educational programs and occupational plans of each student.
5. Read all responses to questions for a single dimension and give a single rating in terms of overall quality of response (i.e., form a "Gestalt" of performance).
6. Rate each of the dimensions of vocational maturity in the same manner.
7. Total the ratings for each dimension to obtain an overall V.M. score.

General Rules

Scores from 0 to 2 will be assigned on the basis of quality of responses, accuracy of information and emphasis on the indicated dimension.

2 - A score of 2 will be given for responses of high quality which indicate that values, sense of agency, occupational role-playing, high morale or use of informed resource persons has played an important part in the vocational decisions and plans of the individual. Strong emphasis on any of these dimensions will be evidence of above average vocational maturity in that area and will always score 2.

1 - A score of 1 will be given for responses which show some understanding and awareness of the dimension under consideration and reveal, at least, loose integration into the individual's decision processes. This score indicates average vocational maturity for a twelfth grade student.

0 - A score of 0 will be given for responses which indicate vague understanding or no awareness of the importance of the dimension under consideration in decision-making. This score indicates immaturity in vocational development and choice.

Because examples of all possible responses could not be included in this scoring manual, the scorer will occasionally be confronted with cases which are ambiguous and leave him undecided between a score of 2 or 1, 1 or 0. In these instances, he should be aware that emphasis on a dimension in the responses and indication of its operation in the student's vocational decision process is the usual requirement of a good score.

Scoring for each dimension is by a "gestalt" method, 1-3. The scorer does not rate each answer separately, but rather considers each one as part of the individual's total response. All questions for a dimension are read together and one score is assigned which reflects performance in that area. While each question is expected to elicit information of equal importance this may not always be the case, the weighting of questions which provide more material from which to judge the student should be increased proportionately.

If an answer has been omitted, this is taken as evidence of a lack of understanding of the dimension being probed and indicates below average vocational maturity. Such an omission usually detracts from the general score. However, if the question has been answered in a previous response or is not applicable to the student's situation (e.g., questions concerning further education directed at the terminal student) the score is unaffected.

Specific Rules for Scoring the Dimensions of Vocational Maturity

Values

Questions 5, 7, 19, 22, 23, 28, 30, 32, 33.
(Particular attention should be paid to questions 5, 22, 23, 32, 33, for they usually contain most of the scorable material.)

The scorer should consider the extent to which values have been incorporated into the decision-making process and their number, meaningfulness and contribution to long range growth.

2 - The student mentions at least three different values, all consistent with his goal and with each other. There is an emphasis on values which are rich in meaning and substantial.

1 - Mentions three different values which are consistent but narrow in meaning OR mentions two values which are rich in meaning and are elaborated on.

0 - Mentions only weak, or narrow values with little consistency; can think of few reasons behind choice.

The following section contains examples of responses which reveal the contribution of value-orientation to vocational maturity. (In most cases these were quoted directly from students interviewed in the Career Development Study.) While the "Gestalt" method does not involve the scoring of individual questions, these examples have been rated in order to suggest the type of response most typical for a student given a rating of 0, 1 or 2.

5.) Now I'd like you to tell me something about these past two years in school. What have you done that you've liked?

2 - Mentions at least two valued activities which are consistent with plans OR one which has definitely advanced occupational plans.

"Latin and French clubs, future teachers club." (teacher)

"Yearbook advertising manager--it was good experience." (business administration)

"Some courses--chemistry, biology, and most of the math courses were interesting and worth taking." (scientist)

1 - Mentions one consistent value with no elaboration.

"Science." (electrician)
"I really like shorthand." (secretary)

0 - Values or valued activities have no relation to goal, are undifferentiated or non-existent.

"Enjoyed basketball games, dancing, skating, swimming."
"I liked everything."

7.) What things have you disliked or regretted?

2 - Mentions something which has interferred with progress of occupational plans.

"I regret the way I set up my schedule--made it harder for me."(Gives concrete suggestions for improvement, reasons surrounding failure.

"Regret working after school. I would have liked to have put more time into my studies."

1 - Mentions no regrets or one which is unrelated to plans.

"Typing, not very important." (teacher)

"Sorry I took French; it might have helped, but I didn't do well."

0 - Regret involves something essential to the success of plans.

"I'm not very good at shorthand." (stenographer)

"High school itself, don't enjoy it at all, seems to be too fixed."

19.) Why have you chosen __________ as first choice?

2 - Mentions two or more reasons or one substantial reason with elaboration.

"I like to work with my hands; there's good money in it."

"I like it so far working on machines." (shoe machine operator)

"I had law in school; I found it interesting and it comes easy to me." (legal secretary)

"I think I'll like it; I like working with kids and there's a need for teachers now."

1 - One reason; simple enumeration of reasons which tend to have weak, narrow bases.

"It's rather interesting and you can learn to handle each person you meet." (stenographer)

"High school teaching is interesting."

0 - Little basis for choice indicated.

"I watched a couple of guys working at it."
"Just like it."

22.) What is the most important factor to consider in making an occupational choice?

2 - Several factors mentioned or elaboration on one which is sufficiently important and value-oriented.

"Whether you have the ability to go through with it, whether you really find it interesting--if you don't you won't put your whole heart in it."

"How well you're fitted for the different phases of the work, if you have enough money to go on to further education, how much money you'll be making."

1 - Mentions one factor but no direct indication of value-orientation.

"What you enjoy doing."
"That you like it and can get interested in it."

0 - No understanding of decision factors.

23.) Why do you consider this fact important?

2 - Indicates an understanding of how the factor(s) mentioned in #22 is related to long-range growth.

"If you don't have the ability or interest, it might be bad for the students; you wouldn't make a very good teacher."

"You must have confidence in yourself to achieve your goal, otherwise you won't get very far."

1 - Indicates that factor is operating in an important way but has no precise knowledge of its role.

"If you enjoy your work, you're more likely to succeed and make good advances."

"If you don't like it, you won't be looking forward to it."

0 - No real understanding of any factor.

"It's my life and I want to make sure what I do is what I want."

"Helps you decide what you want to do."

28.) Which of these activities have you enjoyed?

2 - Interests are directly related to occupational goals.

"Being advertising manager of the yearbook."

1 - Interests show some relation to long range growth.

"The clubs, I like dealing with people." (teacher)

0 - Interests show no relation to plans.

"Being with my friends."
"Summer and swimming."

30.) Have you participated in any activities that you've disliked or regretted?

2 - Regrest activities which have proved an obstacle to the goal and gives reasons.

1 - Regrets activities not related to goal or mentions none.

0 - Regrest activities which might have advanced plans.

32.) What would you like to get out of life? What do you think would make you happy and satisfied?

2 - Mentions three or more different values (much emphasis on consistency and richness of meaning if fewer than three).

"Doing my work well, having enough money, being healthy."

"I'd like to work a while, have a good bank account, travel--see the world, and then get married."

1 - Mentions one or two substantial values.

"Start teaching, get married."
"Steady job."

0 - Factors mentioned are not directly value-centered.

"What I want--that's my main ambition."
"Get through school, do what I really like."

33.) What would you like to get out of work?

2 - Mentions two or more different values.

"Satisfaction of knowing that I'm doing my job well and am able to help somebody."

"Satisfaction that I'm able to help kids and teach them something they didn't know."

1 - Mentions one value.

"As long as it's a good paying job, I'll like it and be satisfied."

0 - No values.

"I don't know."

Sense of Agency

Questions: 4, 13, 21, 26, 39.

2 - Individual reveals activity which is goal-directed, constructive and self initiated; reveals confidence and satisfaction with plans.

1 - Reveals some concern, acceptance of responsibility but not specific, active step, or reveals some self-initiated activity but lacks confidence and satisfaction with plans.

0 - Little concern with choice or no acceptance of responsibility; no confidence or satisfaction expressed.

4.) If you were given another chance, would you still make the same choice (of curriculum)?

2 - Indicates satisfaction with choice made and gives reason for its importance in his plans.

"Yes--it (business course) is challenging and interesting and it gives you a chance to think."

"Yes, I would like to go to college."

1 - Indicates satisfaction but does not elaborate OR indicates some dissatisfaction but still accepts responsibility for choice."

"Yes."

"No, I'd take drafting. Business was my second choice but I enjoy it."

0 - Dissatisfied with choice, no indication of responsibility.

"Yes, but I didn't like the subjects. My whole course was planned wrong."

"No--it didn't work out the way I wanted it to."

13.) Have these results helped you make your decisions about the future? How? If no tests taken--disregard this question.

2 - Indicates realization of the informational value of scores and shows ability to turn facts into information.

"I was all set to be a stenographer anyway, but the scores gave me more confidence."

"Yes, they showed me where my strong points are."

1 - Indication of some realization of information value of scores.

"My scores must have been good; I got accepted to the school."

0 - No realization of importance of tests.

"Not really, no matter what I got, I'd probably do the same thing."

"No."

21.) How do you plan to reach your occupational goal? How will you prepare for it? How will you enter it?

2 - Well structured and coordinated plans--indication of self-direction.

"I'll prepare through school (U. Mass.), then apply at schools for a teaching position with a recommendation from U. Mass."

"I already have a job promised in an insurance company as soon as I graduate."

1 - Plans are still somewhat vague, but indication of concern and some activity.

"Through schooling."

"Co-op school, they help to place you."

0 - Little concern indicated, no activity.

"Maybe it's just a dream (plan to be meteorologist)."

"I don't really know how to go about entering it, anyway I imagine my Father will get me a position."

26.) Do you feel that the occupation you enter is a matter of chance or choice? Explain: Could you tell me why you don't (or do) think it is a matter of chance?

2 - Indicates awareness of own role in determining the course of a future career, and indicates that past decisions influence this.

"I'm the one that makes the choice; it wasn't just chance. I want to be a teacher and that's what I've been working for."

"Choice--I'm the one that decides."

1 - Indicates awareness that the course of his career should be self-determined, but makes no reference to self as agent.

"Choice--what you like depends on it."

"Should be choice; if it's just chance, you won't like it very much."

0 - No awareness of the role of the individual in determining his career.

"I don't know."

"I can't reach my real choice--I'll probably end up in a job by chance, or my father will get me one somewhere."

39.) How certain are you about your educational and vocational plans we have been discussing? Would you tell me why you feel certain (or uncertain) about your plans?

2 - Expresses confidence in success of plans and can substantiate this.

"I'm really sure, I've given it lots of thought, it seems interesting, and I have a job promised me."

"I'm sure; it's what I've always worked for and I've been accepted to college."

1 - Has definite plans but has no positive assurance of success OR expresses confidence but does not back it up.

"I'm pretty certain now that I'm a senior--I've decided what I'm going to do."

"Everything will be O.K. if I get accepted at Chandler."

0 - Plans uncertain and indefinite.

"I'm not certain at all."
"I can do one thing or the other, but I don't know."
"I'm just not sure what I'm fit for."

Role-Playing

Questions 6, 8, 29, 31, 34, 35, 45.

The scorer should consider tne extent to which the student has sought out available ways to implement a concept of himself. The role may be actual (e.g., a job, a school activity), inferred (e.g., the future scientist enjoys physics and chemistry class).

2 - Mentions several attempts at role playing, at least one of which is consistent with abilities and goals; the subject feels confortable in the role.

1 - Mentions several roles which are consistent with ability but are not related to occupational plans.

0 - Role-playing is inconsistent with ability and/or occupational goal or no role-playing is evidenced.

6.) What do you feel you've done especially well?

2 - Satisfaction expressed in connection with performance in a role which is related to the occupational goal.

"I've learned machines at bowling alley and I like to work." (shoe machine operator)

"I do a lot better in math and science and the things that I like than in languages." (science teacher)

"I'm good in typewriting." (stenographer)

1 - Satisfaction with performance in a role which seems to have no direct relationship to occupational goal.

"I do very well in English literature." (secretary)

0 - No role playing, or no satisfaction expressed regarding any role.

"I don't know."

8.) What would you consider your most important experiences in the past two years in school?

2 - The experience cited has contributed substantially to the implementation of the chosen career.

"I learned a lot from the yearbook work as advertising manager." (business administration)

1 - Experience cited seems to have no relationship to the occupational goal.

"When I got a B in History. I'll never forget the day I brought that home; I used to get bad marks."

0 - Subject is unable to cite any important experiences. "nothing" or no response.

29.) Which of these activities do you feel you've done well in?

2 - Satisfaction expressed in connection with activities which relate directly to aspirations.

"I'm good in weather forecasting." (meteorologist)

"Yearbook advertising--I handled the customers well and my advisor seemed pleased." (business administration)

1 - Activities seem unrelated to occupational goals, but reflect individual's abilities in other areas.

"Swimming and water skiing."

"Latin club." (science teacher)

0 - Dissatisfaction with all roles attempted.

"None, I haven't surpassed in anything."

31. Would you tell me something about your strong points? The things you do well in.

2 - Points mentioned relate strongly to success in the chosen field.

"Math and bookkeeping. I enjoy these." (business)

"I'm best in science and possibly math." (science teacher)

1 - Points mentioned relate only slightly to success in the chosen field.

"I'm very good in history." (electronics)

"I'm doing very well in English and I have a good job as a waitress--I get to know everybody." (stenographer)

0 - Points mentioned have no relation to success in the chosen field (and may be detrimental) OR can mention none.

35.) Would you tell me something about your weak points? The things you wish you could do better.

1 - Weak points do not detract substantially from attainment of the occupation goal.

"I wish I was better in math." (secretary)

"Languages--they're interesting though." (science teacher)

0 - Weak points seem to be a detriment to attainment of the occupational goal.

"Typing, you can't erase in school." (stenographer)

"General way of talking to people, wish I could express myself better." (teacher)

"Math." (electronics)

45.) What jobs have you had in the past two years? Which did you enjoy? Which did you dislike?

2 - Employment in positions which gave opportunities for role-playing consistent with goals and abilities; expresses satisfaction with those roles.

"Baby sitting--I love doing things with kids." (teacher)

1 - Employment gave little opportunity for role-playing related to chosen occupation OR employment related to occupational role-playing resulted in dissatisfaction.

"Took telephone orders in a meat store, didn't really enjoy dealing with customers." (business)

"Waitress--it was fun, didn't seem like real work." (stenographer)

0 - No role playing.

"I've never had a job."

Morale

Questions 43, 44, 46, 47, 48, 49, 50, 51, 52

The scorer should consider the student's global feeling about the past two years and the attitude with which he faces the future--especially as regards his occupational goals.

2 - The student indicates strong positive feelings regarding the last two years and indicates progress towards fulfillment of occupational or educational goal; eagerness for goal now in sight.

1 - Indicates positive feelings regarding social and personal life with little or no mention of progress toward goal.

0 - Global feeling toward immediate past and foreseeable future tends to lack enthusiasm, confidence or to be negative.

43.) Can you tell me something about how you feel about going to work?

2 - Strong positive feelings--can already envision the rewarding aspects of the chosen occupation.

"Very much so, it will be interesting and challenging. Millions of people going in and out. It's time for a change of pace."

"I'm all for it--it's a chance to use what I've learned and help people."

1 - Indicates positive feelings; no elaboration.

"Yes, I'd like to go after twelve years of school it's time for a change."

"Yes, I want to go to work; I'm looking forward to it."

0 - Indicates neutral, "inevitable" feelings OR negative feelings.

"There's really nothing else to do after school."

"I don't mind; it sort of depends on the kind of work I do."

44.) When you think about work is there anything you feel would be disagreeable about it?

2 - Mentions no drawbacks connected with feelings toward work or mentions some drawbacks, yet seems ready to face them with good spirits, willing to work to overcome; plus indication that some thought has been put into this assessment.

"No, except possibly the restrictions--but as long as it's interesting I'll like it."

"No, I haven't been able to think of anything really bad about it."

"There may be many discouragements in psychology because people's problems may be difficult, shocking--but it's still what I want."

1 - Mentions no difficulties connected with feelings toward work, but no indication of any intensive investigation into this.

"No, I can't think of anything off hand."

"No, but I'll let you know later on--when I'm working."

"No, everybody has to do it."

0 - Indicates dislike for some major aspect of work in chosen occupation.

"Working with the public--everybody has off days and some are hard to please." (business-sales)

46.) What occupation would you like to be in five years from now?

2 - Occupation is consistent with abilities and with the education program followed.

"Teacher." (college preparatory)

"Electronics." (trade school)

1 - Occupation is consistent with abilities but does not seem to be related to the educational program.

"Meteorologist." (business course)

"Professional bowler." (machine shop)

0 - Occupation is consistent with neither abilities nor the educational program.

e.g., Lawyer (in trade course)

47.) What occupation do you expect to be in five years from now?

2 - Occupation is the same as in question 46.

1 - Occupation is different than question 46, but is consistent with abilities and education.

0 - Occupation is consistent with neither question 46, education or ability OR does not foresee occupational role with any certainty.

"Business, but, I'm not sure, it could be meteorology--
I'm not sure."

48.) If not the same, is there anything you could do to make them the same?

2 - Has envisioned a possible solution to the dilemma.

"After I work a while I'll have enough money to go to college."

1 - Feels a solution is possible but has not worked one out. OR can see no solution, but is satisfied with occupation cited in question 47.

"I bowl a lot and don't seem to get any better, but I like working with machines."

0 - Can see no solution whatsoever.

"No."

"Nothing I can think of."

49.) Would you say in general that these last two years have been good or bad years for you? Why?

2 - Global feeling suggests satisfaction and progress, especially in regard to occupational plans.

"Very good. I'm more sure of where I'm going, of what I'm going. I enjoyed school these past years."

1 - Global feeling suggest satisfaction with social life without mention of progress toward the goal, OR dissatisfaction

initially, beginning to be replaced by satisfaction and progress.

"I had a great time in school, especially the social part."

"These were good years--besides my marks, I really can't complain about anything."

"The first year was bad, I just barely passed and had difficulties with the teacher--but this year everything seems better. I'm enjoying the work and like my teachers."

0 - Global feeling is unenthusiastic or negative.

"Fair--I didn't do very well in my work or in tests."

"All right--I managed to get thru my classes and studies without flunking."

50.) What have been two or three of the best things about them?

2 - At least one of the things mentioned relates to the occupational goals.

"Science classes. I enjoyed some of my teachers." (electronics)

"School activities. Interesting classes like chemistry, biology, and history. (science teacher)

1 - Names at least two good things about past two years.

"I enjoyed the activities I participated in and just being with the kids most of the time."

"Meeting new friends, going places, doing different things."

0 - No positive response.

"Don't know."
"Nothing."

51.) What have been two or three of the most difficult things?

2 - "Difficult things" will prove to be of little or no detriment to the occupational goal.

"History class was pretty hard." (electronics)

1 - "Difficult things" were related to the occupational goals, but came as part of decision process and have been resolved. OR are related to school and social life in general.

"Making decisions about college, where to apply, what courses to take."

"Decision on whether to go to college or not."

"Trying to figure out problems--in school and with my family."

0 - "Difficult things" related to skills needed in occupation. OR no indication that importance of such things is realized.

"Nothing."
"Shorthand." (secretary)

52.) What advice would you give a boy or girl just about to enter high school that you wish someone had given you?

2 - Advice shows assessment of personal shortcomings and proposal of valid solutions.

"They should seriously start thinking about what they want to do after high school and set their mind to it, if they really want to get ahead."

"I had it given to me--try and do your best so you can get out earlier; I regret that I didn't try before."

"Do your best, don't wait until the last year to find out where you're going, learn as much as you can."

1 - Advice is valid but shows no relation to own situation or to occupational decisions.

"Try to get to college; you're better off in life that way."

"The college kids get all the breaks in school." (secretary)

"Get in as many activities as you can; that way you have more fun. Try to get along with the teachers and students."

0 - Can give no valid advice, or indicates the advice is useless.

"Work hard, but I don't think you can tell them--they have their own ideas."

"Have a good time."

Key Person

Questions 3, 12, 16, 17, 20, 25

The scorer should consider the use of informed adults as key person in facilitating the decision process. The use of uninformed persons (parents, friends, etc.) in addition to a counselor or teacher should not detract from the total score unless their influence is overwhelming. Reliance on oneself indicates acceptance of responsibility as long as reliable sources are consulted in major decisions.

2 - Individual sought as reference is a counselor, a person in the occupation aspired to, or a teacher in a field related to that occupation.

1 - Individual sought for advice is an adult whose knowledge of the occupation is limited, but who is familiar with the interests and abilities of the student.

0 - No reliable source is used, e.g., reliance on self or on friend.

3.) Who was especially influential in helping you make this decision?

2 - Reliance on a counselor or, an informed adult.

"Guidance counselor, parents, but the decision was my own."

"Myself mainly, but I talked with the guidance counselors in junior and senior high school."

Home room teacher, guidance counselor, parents, other kids who have gone there (college)."

1 - Reliance on an uninformed adult.

"Mother and father."

0 - No key person involved.

"I did it myself, I knew I had to pick something else."
"I just charged in."
"I can't really say."
"Have to do it myself--it's really my own decision."

12.) Has anyone in school explained what these scores mean?

2 - Has sought out explanation from an informed adult and understands the importance of the scores.

"Guidance counselor. Showed where you stood with students throughout the country and how much chance you had of getting ahead."

"The guidance counselor, they're (college boards) important to tell your general knowledge, and they are important for college entrance."

1 - Scores have been explained--indicates an informed source or some understanding of score.

"Guidance counselor."
"They were explained on a percentile basis."

0 - No explanation sought OR no understanding indicated.

"No."
"They were explained but it didn't mean anything."
"They actually told me nothing."

16.) Whom did you talk with before making your plan?

2 - Informed adult.

1 - Uninformed adult.

0 - Self or friend.

17.) Are you planning to enter an occupation (or to a school) your best friend is going to?

2 - Indicates no tendency to pattern after vocational plans of friends.

"No."
"I don't know."

1 - Indicates similar plans as friends but qualifies this as a coincidence, having no real relation to decision.

"Yes, but it was my own decision--it's what I'm really interested in."

0 - Indicates a tendency to imitate close associates.

20.) To whom have you talked about this occupation.

2 - Informed adult.

1 - Uninformed adult.

0 - Self or friend.

25.) What do your parents think of your educational and/or vocational plans?

2 - Knows parents' feelings and has somehow reconciled them with his own plans.

"They'd rather I went to college, but I think I'd be better off working."

"They think it's a good idea, whatever I want most."

1 - Knows parents' feelings but has not attempted to relate them to decision.

"They like it."
"They think it's far out, don't think I can do it."

0 - No knowledge of parental attitude.

"I don't know. They don't say much about it."

B3: 12th Grade Vocational Maturity Scores

I.D.	VALUES	SENSE OF AGENCY	ROLE-PLAYING	MORALE	PERSON	TOTAL VM-12
Items	5, 7, 19 22, 23, 28 30, 32, 33	4, 13, 21 26, 39	6, 8, 29 31, 34, 35 45	43, 44 46-52	3, 16, 17 20, 25, 12	
MALES						
001						
002	1	2	2	1	1	7
003	1	1	1	1	2	6
004						
005	1	0	1	1	1	4
006	2	0	1	0	1	4
007	2	2	2	2	2	10
008	2	2	1	2	2	9
015	1	2	2	2	2	9
016	1	0	2	1	2	6
017	2	1	2	1	2	8
018	1	2	1	2	1	7
019	1	1	2	0	1	5
020	1	1	2	0	1	5
021	0	0	0	1	0	1
028	2	2	1	1	2	8
029	1	2	2	1	2	8
030	2	2	2	2	2	10
031	1	1	1	1	1	5
032	2	1	2	2	2	9
033	1	2	1	2	2	8
040	1	1	1	2	2	7
041	1	1	2	1	2	7
042	2	1	2	2	2	9
043	1	1	1	1	2	6
050	2	2	1	1	2	8
051	2	2	1	2	1	8
052	1	0	2	0	1	4
053	2	1	0	1	2	6
054	1	1	2	1	1	6

I.D.	VALUES	SENSE OF AGENCY	ROLE-PLAYING	MORALE	KEY PERSON	TOTAL VM-12
055	0	1	1	0	1	3
056	1	1	2	2	2	8
057	2	2	1	2	1	8
064	1	1	2	2	0	6
065	1	1	1	1	0	4
066	1	0	0	1	0	2
067	1	1	2	1	2	7
068	1	2	1	1	2	7
069	1	1	1	0	1	4
076	1	1	0	1	0	3
077	1	2	2	1	2	8
078	0	1	1	0	0	2
079	1	1	2	1	2	7
080	1	1	2	1	0	5
081						
090	1	2	2	2	1	8
092	1	0	2	0	0	3
093	2	2	1	1	2	8
095	1	1	1	1	1	5
096	2	1	1	1	2	7
099	2	2	1	0	2	7
100	2	2	2	2	1	9
102	1	2	1	1	1	6
104	2	2	1	1	2	8
106	2	1	1	2	2	8
108	2	2	1	1	2	8
110	2	2	2	1	2	9
TOTALS (male)	71	69	76	61	75	352
MEANS (male)	1.31	1.09	1.41	1.13	1.39	6.52
FEMALES						
009	1	1	1	1	1	5
010	1	2	0	1	2	6
011	1	0	2	0	1	4
012	2	2	1	0	1	6
013	1	1	1	0	1	4

I.D.	VALUES	SENSE OF AGENCY	ROLE-PLAYING	MORALE	KEY PERSON	TOTAL VM-12
014	2	2	2	2	2	10
022	1	1	1	1	1	5
023	2	1	2	2	0	7
024	1	1	0	1	0	3
025	1	2	2	1	2	7
026	2	1	1	2	1	7
027	0	1	0	0	0	1
034	2	2	2	1	2	9
035	2	1	2	1	2	8
036	2	1	1	1	2	7
037	2	2	2	1	2	9
038	2	2	2	1	2	9
039	2	2	1	1	1	7
044	2	1	1	1	1	6
045	2	2	2	2	2	10
046	1	1	1	1	2	6
047	1	2	1	1	1	6
048	1	1	0	1	0	3
049	1	0	1	0	0	2
058	2	1	1	1	2	7
059	1	1	2	1	2	7
060	2	2	2	2	2	10
061	1	0	1	1	1	4
062	1	2	1	2	1	7
063	0	1	2	1	2	6
070	1	2	1	1	2	7
071	2	2	2	1	1	8
072	1	1	1	1	1	5
073	1	1	1	1	0	4
074						
075	2	1	2	1	1	7
082	0	1	1	1	2	5
083	1	2	1	1	0	5
084	0	1	1	1	1	4
085	1	2	2	1	1	7
086	2	2	2	1	2	9
087						
088	0	0	1	1	1	3
089	1	2	2	1	1	7
091	1	1	2	2	1	7

I.D.	VALUES	SENSE OF AGENCY	ROLE-PLAYING	MORALE	KEY PERSON	TOTAL VM-12
094	1	2	0	1	1	5
097	1	1	1	1	2	6
098	1	1	1	1	2	6
101	0	1	2	1	1	5
103	2	2	2	1	2	9
105	1	1	0	1	1	4
107	1	1	0	0	2	4
109	2	2	2	1	2	9
111	1	0	2	0	2	5
TOTALS (female)	65	66	60	46	65	308
MEANS (female)	1.25	1.26	1.15	.88	1.25	5.92

APPENDIX C

New Readiness for Career Planning Instrument

C1: Readiness for Career Planning (RCP) Interview Schedule

An 8th-grade Guidance Interview Schedule
Warren D. Gribbons and Paul R. Lohnes
(Copyright Pending, 1967

****

I. Classification Questions

1. Name ______________________________

2. Sex: M F 3. Age (months) _____ 4. Date ______________

5. School ____________________________ 6. Home Room __________

7. Program choice for 9th grade ____________________

8. Is choice firm (F) or tentative (T)? F T

9. Highest grade of education planned _____
Details ______________________________ 10. F T

11. Occupational aspiration; first choice ____________________

12. F T 13. Second choice ____________ 14. F T

15. At home: both parents ____; one parent ____, F M ;
other ______________________________

16. Father's (or guardian's occupation ____________________

****

Comments:

II. RCP Questions

1. What curriculum programs are available in the 9th grade? 0 1 2

2. Why did you choose the XXX program? (or: How will you choose a program? Can you say what program you might choose?) 0 1 2

3. Why didn't you choose the other programs? 0 1 2

4. What are the advantages of a college preparatory program? 0 1 2

5. What are the advantages of the otherprograms 0 1 2

6. What should you know about yourself before choosing a program? 0 1 2

7. What courses must everyone who chooses the XXX program take in the 9th grade? 0 1 2

8. How can you predict your chance of success in your different 9th-grade courses? 0 1 2

9. What differencd does it make if you take algebra or another math course in 9th grade? 0 1 2

10. Why would you like to become an XXX? 0 1 2

11. What should you know about yourself before choosing an occupation? 0 1 2

12. What education and training is required to be an XXX? 0 1 2

13. Describe the work done by an XXX. 0 1 2

14. What connection do you see between the courses you'll be taking in 9th grade and the work you want to do later on? 0 1 2

15. What abilities do you have that will help you to be successful in your 9th grade program? 0 1 2

16. What abilities do you lack that would be helpful in your 9th grade program? 0 1 2

17. What abilities do you have that will help you to be successful in the work you are planning for later on? 0 1 2

18. What abilities do you lack that would be helpful in your chosen occupation? 0 1 2

19. What particular interests do you have that your chosen occupation would satisfy? 0 1 2

20. Things that are important to us we call our values. Tell me some of your values. 0 1 2

21. What values of yours would working as an XXX satisfy? 0 1 2

22. What part should adults such as parents and teachers play in making plans for your future? 0 1 2

/______

RCP Total:

****

Comments:

C2: Instructions for Conducting and Scoring the RCP Interview

The Readiness for Career Planning (RCP) Instrument is first a schedule for a counselor's interview with a junior high school student who is in the process of making a decision about a curriculum program for his high school years. Secondly, it is a rating scale for scoring the student on a dimension of vocational maturity. The counselor rates each of 22 item responses for degree of maturity displayed as soon as the student completes his free response. After the session the counselor totals the item scores to record the RCP score. The interview allows the student and the counselor to get to know each other and the counselor to become familiar with the content of the student's aspirations, plans, and his approach to decision making. The RCP score provides a unique element for the student's psychometric profile as it exists in his school cumulative record. In conjunction with other elements of his measurement profile, this trait indicator contributes to the services the guidance measurement system provides to the student.

Normally the interview would occur in the first part of the eighth grade year, and the questions are phrased about programs and courses for the ninth grade. In some school systems it may be desirable to conduct these interviews in the seventh or ninth grades, if the timing of program differentiation so indicates. Then the questions should be phrased in terms of the eighth or tenth grade programs and courses. Also, terms such as "program" and "course" employed in the schedule may require changing to such terms as "curriculum" and "subject" to suit local usage.

When the student arrives for the interview, he should be told that the purposes of the session are for the student and counselor to get to know each other; for the student to inform the counselor about his ambitions for his long-range future and his plans for the ninth grade, and about how he makes his plans; and for the counselor to reach a judgment about the satisfactoriness of the student's approach to planning.

The first section of the schedule contains classification questions, which should be introduced to the student as "getting to know who you are" matters. If the student is able to give answers to questions 7, 9, 11, the "F" in questions 8, 10, and 12 should be circled. The "T" is circled only if answers to these plans questions are elicited later in the interview in response to probing. The student should not be pressed for a second choice occupational aspiration in question 13.

As the student completes his free response to each question of Part II the counselor instantly rates the response on a three-point scale. He need not record the content of the response, only his rating of it. Of course, the counselor may want to make notes on some response contents in the question or "Comments" areas. For several items, the response is rated for the degree of vocational maturity it displays, as follows:

rating	judged nature of response
0	immature; based on fantasy or authority considerations only; illogical; irrelevant
1	mature; based on one or more relevant and logical considerations drawn from *only one* of the three classes of factors listed below
2	superior; based on two or more relevant and logical considerations drawn from *at least two* of the three classes of factors listed below

The three classes of factors for consideration in choosing and planning are:

class 1	personal abilities
class 2	personal values, interests, needs
class 3	social values and institutional procedures; social pressure

The items rated by this rule are items 2, 3, 4, 5, 6, 9, 10, and 11.

For several other items, the response is rated according to the number of mature considerations it contains, as follows:

rating	judged nature of response
0	immature; no relevant and logical consideration
1	mature; *one* relevant and logical consideration
2	superior; *two or more* relevant and logical considerations

The items rated by this rule are items 8, 12, 13, 14, 15, 16, 17, 18, 19, 20, and 21.

For a third set of items, the response is rated according to correctness and completeness of information it contains, as follows:

rating	judged nature of response
0	immature; no correct information or only one piece of correct information

1	mature; two or more pieces of correct information, but less than the total list or a full representation
2	superior; a full list of correct information or a full representation

The items rated by this rule are items 1 and 7.

Question 22, on autonomy of planning, is rated as follows

rating	judged nature of response
0	childish dependence or childish rebellion at adult authority
1	statement of appreciation of need for adult counsel or statement of need for emerging self-direction and autonomy
2	statements both of need for adult counsel and need for emerging self-direction and autonomy

The counselor will need to exercise particular skill in the case of a student who does not express a ninth grade program choice or an occupational aspiration during the classification questions portion of the interview. Some students will have good reasons for not answering one or both of these questions, yet they will be penalized in the RCP questions if they do not have at least tentative plans or aspirations to relate their responses to. A student who has not made a choice among high school programs should be encouraged (but not forced) to express a tentative preference in response to RCP Question 2, and his preference should be recorded in Classification Question 7, with "T" circled in 8. Likewise, a student without a firm occupational aspiration should be encouraged to express a preference in RCP Question 10, at least "for purposes of this discussion," and his response recorded in Classification Question 11, with a circle around "T" in 12. The counselor should remember that it is not necessarily immature for a student in this stage of career development to be uncommitted to an occupational goal.

During or after the interview the counselor may wish to write notes on the contents of responses to particular questions in the spaces provided, and after the interview he may want to write up his general impressions in the Comments space at the end of the schedule. The 22 RCP item scores should be added up to the RCP Total Score, which is recorded in the box on the last page of the protocol.

APPENDIX D

Career Tree Behaviors, 1958-1967

D1: Career Tree Structure Transition Score Vectors for 111 Career Development Study Subjects

Subject	Sex	1958	1961	1963	1965	1967	Type
1	M	1	2	2	4	5	Fq
2	M	1	1	2	4	9	J
3	M	1	1	1	2	10	J
4	M	1	4	4	8	12	J
5	M	1	1	4	8	9	J
6	M	1	1	1	7	9	J
7	M	2	4	4	8	12	F
8	M	1	4	4	7	10	J
9	F	1	2	4	8	11	J
10	F	2	4	4	8	11	F
11	F	2	4	4	8	11	F
12	F	2	4	4	8	11	F
13	F	1	4	3	7	7	J
14	F	2	4	4	8	11	F
15	M	1	2	2	2	4	J
16	M	2	1	4	6	8	J
17	M	2	3	2	7	5	J
18	M	2	1	1	8	10	J
19	M	1	2	1	8	10	J
20	M	1	3	3	5	5	J
21	M	1	2	2	4	5	Fq
22	F	2	4	3	6	7	J
23	F	2	3	3	5	7	F
24	F	2	3	3	6	8	F
25	F	2	3	3	6	8	F
26	F	2	4	3	5	7	J
27	F	2	3	3	6	8	F
28	M	1	1	1	1	11	J
29	M	1	2	1	8	12	J
30	M	2	4	4	8	11	F
31	M	2	4	4	8	11	F
32	M	1	1	1	1	2	F
33	M	1	4	4	8	10	J
34	F	1	2	2	1	2	J
35	F	2	3	3	5	7	F

Subject	Sex	1958	1961	1963	1965	1967	Type
36	F	2	4	4	6	8	J
37	F	2	4	4	8	12	F
38	F	2	4	4	8	8	J
39	F	2	4	4	8	12	F
40	M	1	1	2	7	9	J
41	M	1	1	2	1	12	J
42	M	1	4	3	7	5	J
43	M	1	2	4	8	9	J
44	F	2	3	3	5	7	F
45	F	2	2	1	1	2	J
46	F	2	3	3	5	7	F
47	F	2	4	4	8	8	J
48	F	2	3	3	6	8	F
49	F	2	3	3	5	7	F
50	M	1	4	3	2	4	J
51	M	2	3	3	5	7	F
52	M	1	2	3	6	5	J
53	M	2	4	4	6	8	J
54	M	2	4	4	6	8	J
55	M	2	4	3	8	11	J
56	M	2	3	3	6	8	F
57	M	1	1	4	8	11	J
58	F	2	3	3	5	7	F
59	F	2	3	3	5	7	F
60	F	2	1	2	3	5	J
61	F	2	3	3	6	7	Fq
62	F	2	3	3	6	7	Fq
63	F	2	3	2	3	5	J
64	M	2	3	3	6	7	Fq
65	M	1	1	3	3	5	J
66	M	2	2	2	3	5	J
67	M	2	4	4	8	12	F
68	M	1	1	2	3	7	J
69	M	2	4	4	6	8	J
70	F	2	4	3	5	8	J
71	F	2	3	3	5	7	F
72	F	2	3	3	5	8	Fq
73	F	2	3	3	6	8	F
74	F	2	3	3	5	7	F
75	F	2	3	3	6	8	F

Subject	Sex	1958	1961	1963	1965	1967	Type
76	M	1	2	2	3	8	J
77	M	1	4	3	6	8	J
78	M	1	2	2	4	6	F
79	M	1	2	2	3	2	J
80	M	1	2	2	3	5	F
81	M	1	2	2	4	6	F
82	F	2	4	4	5	8	J
83	F	2	3	3	5	7	F
84	F	1	3	3	5	7	J
85	F	2	3	3	6	8	F
86	F	2	4	3	6	8	J
87	F	2	3	3	5	7	F
88	F	2	3	3	5	7	F
89	F	2	2	2	1	5	J
90	M	1	2	2	4	6	F
91	F	1	3	3	5	7	J
92	M	1	2	4	8	9	J
93	M	1	1	1	8	12	J
94	F	2	3	3	5	7	F
95	M	1	2	2	4	6	F
96	M	1	1	1	2	4	F
97	F	1	2	2	1	2	J
98	F	2	1	1	8	12	J
99	M	1	1	1	2	5	J
100	M	1	1	1	2	4	F
101	F	1	2	2	5	5	J
102	M	2	4	4	7	9	F
103	F	1	4	4	8	5	J
104	M	1	1	4	3	8	J
105	F	1	2	3	6	7	J
106	M	1	1	1	1	2	F
107	F	2	3	3	6	7	Fq
108	M	1	4	4	6	5	J
109	F	2	3	3	6	8	F
110	M	1	1	1	2	dead	F
111	F	2	3	3	5	8	Fq

Type Codes:

F = path-follower
Fq = quasi-path-follower
J = path-jumper

D2: Transitions from 8th Grade Two-Group Tree Variable to 10th Grade Four-Group Variable (N = 111)

		10th grade (1961)			
		College Scientific	Non-college Technology	Non-college Socio-cult	College Socio-c
8th grade	Science, Technology	18*	20*	3	9
	Social, Cultural	4	3	31*	23*

* indicates path-following transitions

D3: Transitions from 10th Grade Four-Group Tree Variable to 12th Grade Four-Group Tree Variable (N = 111)

		12th grade (1963)			
		College Scientific	Non-college Technology	Non-college Socio-cult	College Socio-c
10th grade	College Scientific	12*	5	1	4
	Non-college Technology	3	15*	2	3
	Non-college	0	2	32*	0
	College	0	0	9	23*

* indicates path-following transitions

D4: Transitions from 12th Grade Four-Group Tree Variable to Two Years out of H.S. Eight-Group Tree Variable (N = 111)

		Two Years out of H.S. (1965)+							
		1	2	3	4	5	6	7	8
12th grade	College Scientific	4*	5*	0	0	0	0	1	5
	Non-college Technology	4	1	7*	7*	1	0	2	0
	Non-college	0	1	1	0	21*	18*	2	1
	College Social, Cultural	0	0	1	0	1	6	2*	20*

+ the eight-group tree variable:

1. College: Biological, Medical
2. College: Physical Science, Engineering, Mathematics
3. Non-college: Technology, Post H.S. Training
4. Non-college: Technology, No Post H.S. Training
5. Non-college: Socio-cultural, No Post H.S. Training
6. Non-college: Socio-cultural, Post H.S. Training
7. College: Business
8. College: Social, Cultural

* indicates path-following transitions

D5: Transitions from Two Years out of H.S. Eight-Group Tree Variable to Four Years out of H.S. Twelve-Group Tree Variable (N = 110)

Two Years	Four Years out of High School (1967)+											
Out (1965)	1	2	3	4	5	6	7	8	9	10	11	12
I	0*	5*	0	0	1	0	0	0	0	0	1	1
II	0	0	0*	4*	1	0	0	0	0	1	0	0
III	0	1	0	0	5*	0	1	2	0	0	0	0
IV	0	0	0	0	2	4*	0	0	1	0	0	0
V	0	0	0	0	2	0	17*	4	0	0	0	0
VI	0	0	0	0	2	0	6	16*	0	0	0	0
VII	0	0	0	0	2	0	1	0	3*	1*	0	0
VIII		0	0	0	1	0	0	2	3	2	9*	9*

+ the twelve-group tree variable:

1. Ph.D., M.D.: Biological, Medical
2. D.D.S., M.S., B.S.: Biological, Medical
3. Ph.D.: Physical Science, Engineering, Mathematics
4. M.S., B.S.: Physical Science, Engineering, Mathematics
5. Non-college: Technology, Post H.S. Training
6. Non-college: Technology, No Post H.S. Training
7. Non-college: Business, No Post High School Training
8. Non-college: Business, Post H.S. Training
9. B.S.: Business
10. M.S., Ph.D.: Business
11. B.S.: Social, Cultural
12. M.S., Ph.D.: Social, Cultural

* indicates path-following transitions

APPENDIX E

Career Development Study 1968/69 inventory Schedule

E1: Females

Name ____
Husband's Name ____
Address ____
Marital Status: Married _____ Single _____ Plan to be Married Within Next Year _____ No. of children _____
Occupation: Title of Job _________________________________
Description and duties of job, including number of hours per week ____
Husband's Occupation ____________________________________
Future Occupational Plans: (type of work or job you expect to be in five years from now ________________________________
Education: (Please include length of training, degree of certificate received, name of school, type of program) ________________
Educational Plans for the Future: __________________________

We would like very much to have you use the reverse side for any comments about your work, education, leisure time activities, plans for the future, etc.

E2: Males

Name ____
Address ____
Marital Status: Married _____ Single _____ Plan to be Married Within Next Year _____ No. of children _____
Occupation: Title of Job _________________________________
Description and duties of job, including number of hours per week ____
Future Occupational Plans: (type of work or job you expect to be in five years from now) ________________________________
Military/Draft Status: ____________________________________
Education: (Please include length of training, degree or certificate received, name of school, type of program) ________________
Educational Plans for the Future: __________________________

We would like very much to have you use the reverse side for any comments about your work, education, leisure time activities, plans for the future, etc.

E3: Career Development Study - 1969 Status of Subjects

High School Plus 6 Years

Code	Occupation	Career Tree	Occupational Aspiration	Educat. Achiev.	Educat. Aspir.	Marital Status	Military Status
1	Parts Mgr.-Shipping, Rec., Ordering, Bookkeeping	NC-NT	Claims Adjuster Insurance Co.	(3) 14 yrs.	None	M-2	Comp. 6 yrs. Active
2	Machinist Trainee/ Metal Finisher	NC-T	Undecided, but MA in Sociol. planned	(3) 14 yrs.	M.A.	S	Comp. Act.
3	Student (MIT)	C-S	Consultant in Organizational Develop.	(1) 18 yrs.	Ph.D.	S	1-Y
4	Student (B.U. Law)	C-NS	FBI-Not sure if practice law	(1) 17 yrs.	LL.B. M.A.-Pol. Science	S	Will join reserves
5	Auto Salesman	NC-NT	Undecided, but not auto sales	(3) 15 yrs.	Undec.	S	1-Y
6	Coat Salesman - Sell to Retail Stores	NC-NT	To have own Women's Clothing Store	(5) 12 yrs.	None	M	1-Y
7	Student (Columbia Law)	C-NS	Lawyer	(1) 18 yrs.	LL.B.	M	1-Y
8	Student (Columbia Grad School of Business)	C-NS	Financial Planning or Banking	(1) 18 yrs.	MBA	S	3-A
9	Student (Columbia Sch. of Library Science)	C-NS	Library Work in Univ. or Research Center	(1) 17 yrs.	M.L.S.	S	

Code	Occupation	Career Tree	Occupational Aspiration	Educat. Achiev.	Educat. Aspir.	Marital Status	Military Status
10	Secretary	C-NS	Teach if not married	(2) 16 yrs.	Teach. Cert.	S	
11	Unemployed	NC-NT	Undecided	(3) 14 yrs.	B.A.	S	
12	Elem. School Teacher (Gr. 1)	C-NS	Guidance/Clin. Psy.	(2) 16 yrs.	M.A.	S	
13	Housewife	NC-NT	Housewife	(3) 14 yrs.	None	M	
14	Insur. Grp. Claims Approver/Student (B.U.) in Urban Affairs	NC-NT	Housewife	(3) 15 yrs.	B.A.	S	
15	Warehouseman-Loading Pkgs. onto rollers for trucks-Temporary until full-time Student (U. Mass. Lib. Arts)	C-NS	Undecided	(3) 14 yrs.	B.A.	M	Completed
16	Senior Computer Operator-IBM 360/Student (No. Shore Comm. Coll.)	NC-NT	Management Info. Systems - Data Processing	(3) 14 yrs.	B.S.	M	Exempt
17	Boilermaker-Repair, rebuild navy marine boilers	NC-T	Registry of Motor Vehicles Inspector	(5) 12 yrs.	None	M	1-Y
18	Unknown (have info. he tried to join VISTA, but cannot locate him)	C-NS		(2) 16 yrs.			

Code	Occupation	Career Tree	Occupational Aspiration	Educat. Achiev.	Educat. Aspir.	Marital Status	Military Status
19	Spc/4 Army-Hawk Radar Repairman for Missile System	NC-T	Undecided	(3) 13 yrs.	B.A.	S	Active
20	Killed in Vietnam						
21	Lay Minister (Jehovah's Witness) Bank Teller (part-time, 18 hrs.) Enrolled in Ministry School	NC-NT	Same	(5) 12 yrs.	Ministry School	M	Refused induction, Awaiting court call
22	Telephone Co. Directory Clrk., Asst. Supervisor	NC-NT	Supervisor of same	(5) 12 yrs.	None	S	
23	Housewife/Typist	NC-NT	Same/Bookkeeping	(5) 12 yrs.	None	D	
24	Teletype/Operator	NC-NT	Same	(5) 12 Yrs.	None	S	
25	Secretary/Salesgirl	NC-NT	Same	(4) 12 yrs.+	None	S	
26	Princ. Clrk/Clerical & Supervise 8 girls/ Housewife	NC-NT	Housewife	(5) 12 yrs.	None	M	
27	Clerk	NC-NT	Unknown	(5) 12 yrs.	Unknown	S	
28	Student (U.Mass.-Economics)	C-NS	Management	(3) 14 yrs.	MBA	M	Completed

Code	Occupation	Career Tree	Occupational Aspiration	Educat. Achiev.	Educat. Aspir.	Marital Status	Military Status
29	Lt. JG, USN Intell. Officer-Instruct replacement pilots to S.E. Asia-classified	C-S	Lawyer	(2) 16 yrs.	LL.B.	M	Active
30	Sgt., Transp. Opns., Control trucks in Tactical Truck Co. (Amry)	NC-T	Commission in Spec. Services, Degree in Bus. Mgt. in Army	(5) 12 yrs.	B.A.	S	Active
31	Student (Gordon Coll. 2nd Ed. and History	C-NS	Teach/Guidance	(2) 16 yrs.	M.A.	S	Nat'l Guard
32	Ensign-USN	C-S	Dentistry	(2) 16 yrs.	D.D.S.	S	Active
33	Investment Trainee-Eval. Portfolios of Trust Co. Accounts	C-NS	Investment Analyst	(1) 18 yrs.	Corres. Crse-Cert. Fin. Anal.	M	Canadian Citizen
34	Nurse (on leave of absence)/Housewife	C-S	Nurse/Housewife	(3) 15 yrs.	Undecided	M	
35	Housewife	NC-NT	Housewife	(5) 12 yrs.	None	M	
36	Secretary/Housewife/ Student	NC-NT	Housewife/Type at home	(4) 13 yrs.	B.A.-Teach. Certif.	M	
37	Student (Columbia Grad. Sch., French Maj.)/ Teacher of Dancing	C-NS	Teacher College	(1) 17 yrs.	M.A. Ph.D.	S	

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38	Secretary/Asst. to Real Estate Broker	NC-NT	Undecided	(3) 15 yrs.	None	S	
39	Teacher - Elementary (2nd Grade)	C-NS	Teacher	(2) 16 yrs.	None	S	
40	Unemployed-just disch. from service	NC-NT	Computer or Accounting	(4) 12+ yrs.	B.S.	S	Inactive Reserves
41	Student (changed maj. after 2 yrs. and req'd 2 extra yrs. for B.S.	C-NS	Phys. Ed. Teacher	(2) 16 yrs.	Master Physical Therapy	S	Enlist after graduation
42	Salesman for 7-Up-Del. and sell 7-Up to stores	NC-NT	Supervisor in same company	(5) 12 yrs.		M	Completed
43	Ins. Agt.-Sell and Serv. Life Insurance	NC-NT	Open insurance agency	(4) 13 yrs.	Undecided	M	3-A
44	Head Bank Teller	NC-NT	Desk work in loan department	(5) 12 yrs.	None	S	
45	Dental Hygienist/Stud. (Ohio State U.-Pub. Health Major)	C-S	Teach Dental Hygiene - Secondary Level	(2) 16 yrs.	Grad. Sch. Undecided Major	S	
46	Housewife	NC-NT	Housewife/Accounting for husband	(4) 13 yrs.	None	M	
47	Housewife	NC-NT	Housewife	(4) 13 yrs.	Uncertain	M	
48	Secretary/Housewife	NC-NT	Housewife	(3) 14 yrs.	None	M	

Code	Occupation	Career Tree	Occupational Aspiration	Educat. Achiev.	Educat. Aspir.	Marital Status	Military Status
49	Secretary/Housewife	NC-NT	Housewife	(6) Less than 12 yrs.	None	M	
50	USN Electronics Technician	NC-T	Electronics Tech. (temporarily	(4) 12+ yrs.	College	S	Active Disch. 6-69
51	Electromechanical Assembler - assembles electric heating panel for homes, etc.	NC-T	Foreman at same job	(5) 12 yrs.	None	M	4-F
52	Jr. Cost Acct. in bank/ Student (Northeastern night courses in acctg.)	NC-NT	Accountant	(4) 12 yrs.	Continue courses	M	USA Reserve
53	Design Draftsman	NC-T	Same	(4) 13 yrs.	None	M	
54	Head shipper at shoe factory	NC-NT	Salesman-Mgr. Shoe Business	(4) 12+ yrs.	None	S	Completed
55	Operate Surveying Instruments	NC-T	Journalism	(3) 14 yrs.	B.A.	M	1-Y
56	Manager of Branch Bank	NC-NT	Same	(5) 12 yrs.	None	S	
57	Still Photographer and Lab Tech., USAF	NC-T	Photographer-Forestry Field	(3) 14 yrs.	B.S.	S	Active
58	Housewife	NC-NT	Secretary/ Housewife	(5) 12 yrs.	Misc. Crs.	M	

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59	Housewife	NC-NT	Housewife	(5) 12 yrs.	None	M	
60	Histologist at Research Instit./Regist'd Funl. Dir. and Embalmer	NC-T	Funeral Bus./ Housewife	(3) 13+ yrs.	None	S	
61	Housewife	NC-NT	Housewife/ Bookkeeper	(5) 12 yrs.	Misc. Courses	M	
62	Housewife	NC-NT	Housewife/ Singer	(4) 12+ yrs.	None	M	
63	Dental Assistant	NC-T	Housewife	(4) 13 yrs.	Misc. Courses	S	
64	Musician/Grillman	NC-NT	Musician/ Tradesman	(5) 12 yrs.	Undec.	S	1-Y
65	Boring Mill Operator	NC-T	Undecided	(4) 13 yrs.	Training program possible		3-A
66	Boatswain Mate, 3rd, USN/ Crane operator, painting	NC-T	Machinist	(4) 12+yrs.	College Possibly	M	Active
67	Teacher, Jr. Hi Engl./ Suudent (Suffolk nights)	C-NS	High School Teacher	(1) 16+ yrs.	M.A.	S	Occup. Defer.
68	Assistant Floor Mgr. (Lg. Dept. Store)	NC-NT	Dept. Store Management	(4) 13 yrs.	Company Training	S	Nat'l Guard

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69	Sales Dist. Mgr. for Dictionaries, Door-to-Door Office,, Bus. People	NC-NT	Executive in same company	(5) 12 yrs.	Misc. Courses	S	Nat'l Guard
70	Secretary/Housewife/ Student	NC-NT	Teach at Junior College Level	(4) 12+ yrs.	B.A.	M-2	
71	Housewife	NC-NT	Housewife	(5) 12 yrs.	None	M	
72	Clerk/Housewife	NC-NT	Housewife	(4) 12+ yrs.	None	M	
73	Control Clerk/Housewife. Prepare data for computer processing	NC-NT	Uncertain	(5) 12 yrs.	None	M	
74	Housewife	NC-NT	Uncertain	(6) -12 yrs.	H.S. equiv.	M-2	
75	Housewife/Waitress	NC-NT	Housewife/ LPN	(5) 12 yrs.	LPN	D	
76	Bank Teller	NC-NT	Refrigeration	(5) 12 yrs.	Misc. Courses	M	1-Y
77	Mgr. Retail Women's Apparel Store-Supervise, Assist with Sales	NC-NT	Management Insurance/ Banking	(5) 12 yrs.	Misc. Courses	S	4-A Complete
78	Floor Boy - Supplies vacuum parts, hoses to men	NC-NT	None	(5) 12 yrs.	None	S	Complete

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79	Wood Pattern Maker	NC-T	Engineer	(5) 12+ yrs.	B.S.	M	Completed
80	USN Radioman, RM3, R Radio Watch Stander, Supply P.O.	NC-T	Electronics Tech.	(4) 12 yrs.	None	M	Active
81	Dump Truck Driver	NC-T	Same	(6) -12 yrs.	None	M	3-A
82	Housewife	NC-NT	Housewife/ LPN	(4) 12+ yrs.	LPN	M	
83	Cathode Sprayer/ Housewife	NC-T	Housewife	(5) 12 yrs.	None	M	
84	Housewife	NC-NT	Housewife	(4) 12+ yrs.	None	M	
85	Housewife	NC-NT	Housewife	(4) 12+ yrs.	LPN	M	
86	Housewife	NC-NT	Housewife	(4) 12+ yrs.	LPN (est.)	M	
87	Housewife	NC-NT	Housewife	(6) -12 yrs.	None	D	
88	Housewife	NC-NT	Housewife	(5) 12 yrs.	None	M	
89	Nurse/Housewife	C-S	Nurse/ Housewife	(3) 15 yrs.	None	M	

Code	Occupation	Career Tree	Occupational Aspiration	Educat. Achiev.	Educat. Aspir.	Marital Status	Military Status
90	Farm Tractor Mechanic/ Owner of Small Dry Cleaning Business	NC-T	Improved future in same company	(5) 12 yrs.	Company School	M	Active Navy Res.
91	Clerk-Typist/ Housewife	NC-NT	Housewife	(5) 12 yrs.	None	M	
92	Mgmt. Trainee-Shipping, Rec'g, Pricing, Buying, Selling	NC-NT	Undecided	(4) 13 yrs.	B.S. if not satis. with present job	S	Completed
93	Student/Clerk (Bus. Adm.-Salem State)	C-NS	Undecided: Law, Mngt, Teach	(2) 15+ yrs.	B.S./M.A. ?? Master's	S	Nat'l Guard
94	Secretary/Jr. Underwriter Ins.	NC-NT	Housewife	(5) 12 yrs.	None	S	
95	Mechanic-Repair and Service, cars and trucks	NC-T	Uncertain	(5) 12 yrs.	None	S	Completed
96	Wholesale Flower Salesman/Student (Merrimack Even. Coll., Electrical Engineering	NC-NT	Uncertain	(3) 14+ yrs.	B.S.	M	3-A
97	Nurse	C-S	Same	(3) 15 yrs.	None	S	
98	Bio. Grad. Asst./Lab Instr./Student (UNH)	C-S	Area of Nat'l History with children	(1) 18 yrs.	Undec.	S	

Code	Occupation	Career Tree	Occupational Aspiration	Educat. Achiev.	Educat. Aspir.	Marital Status	Military Status
99	USA Mechanic-Repair Wheel and Track Vehicles	NC-T	Electrical Engineer	(3) 14 yrs.	B.S.	S	
100	Research Engineer-Design Electronic Equipment-Quantum Physics	C-S	Same - more responsiblitty	(1) 17 yrs.	None Immed.	S	2-A Occup. Defer.
101	Admitting Secretary in Hospital/Housewife	NC-NT	Same	(5) 12 yrs.	None	M	
102	Asst. Mgr. Men's Clothing Store	C-NS	Owner of Men's Clothing Store	(2) 16 yrs.	Undec.	M	1-Y
103	Student (Practical Nurse)/Housewife	NC-T	Nurse/Housewife	(4) 13 yrs.	B.S.	M	
104	AF Sgt. - Communications/Non-Morse Intercept Operator	NC-T	AF Career	(4) 13+ yrs.	Misc. Courses	M	Active
105	Clerk/Housewife	NC-NT	Housewife	(5) 12 yrs.	None	M	
106	Dist. Off. Mgr. Responsible for acctg. to central off., personnel administration	C-NS	Middle Management in Accounting/Sales or Teaching	(2) 16 yrs.	MA-Bus. Adm.	M	3-A
107	Clerk	NC-NT	Same	(4) 13+ yrs.	None	S	
108	USN Aviation Electronics Technician	NC-T	Electronics Field	(4) 12+ yrs.	Undec.	M	Active

Code	Occupation	Career Tree	Occupational Aspiration	Educat. Achiev.	Educat. Aspir.	Marital Status	Military Status
109	Ballet Dancer	NC-NT	Same	(3) 12+ yrs.	Cont. Study	S	
111	Housewife	NC-NT	Housewife	(5) 12 yrs.	None	M	

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